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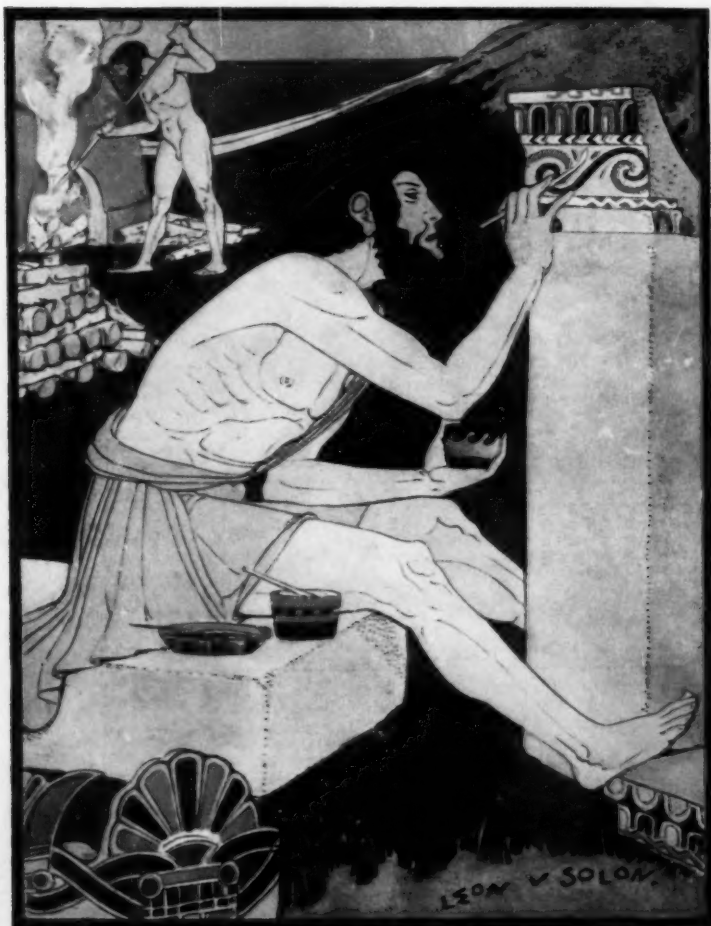
THE

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ARCHITECTURAL RECORD

FEBRUARY 1919



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Bishopric Board Makes Stucco Finish Popular

When a scientifically constructed background for Stucco was discovered—a background that would **clinch** the stucco so it **couldn't** crack or flake off—then the stucco home led in public favor.

Bishopric Board was "discovered" six or eight years ago and Bishopric Board was the background used in the home of Mr. P. N. Leone at Hartford, Conn., illustrated above, and recommended by Architect R. F. Barker.

Bishopric Board is merely a combination of certain building principles and materials that have been in successful use for untold centuries. It's "Built on the Wisdom of Ages."

Note its construction in illustration below—creosoted lath imbedded in Asphalt Mastic on a background of heavy fibre-board. These materials give absolute protection against heat, cold, wind and weather, and are water, vermin and sound proof.

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Build a stucco house with Bishopric Board, using the right stucco mixture, and you will secure in largest measure the qualities of beauty, wear and comfort.

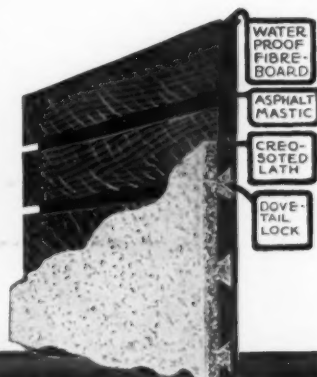
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Write for our free book, "Built on the Wisdom of Ages." Illustrating homes, apartments, factory and public buildings finished in stucco on Bishopric Board. It contains letters from architects, builders and users, and extracts from reports of scientific tests. It also gives full instructions for making a stucco mixture that will last. With this book we send free samples of "Bishopric" Board.

Write today; investigate for yourself; be convinced.



THE ARCHITECTURAL RECORD



Vol. XLV. No. 2

FEBRUARY, 1919

Serial No. 245

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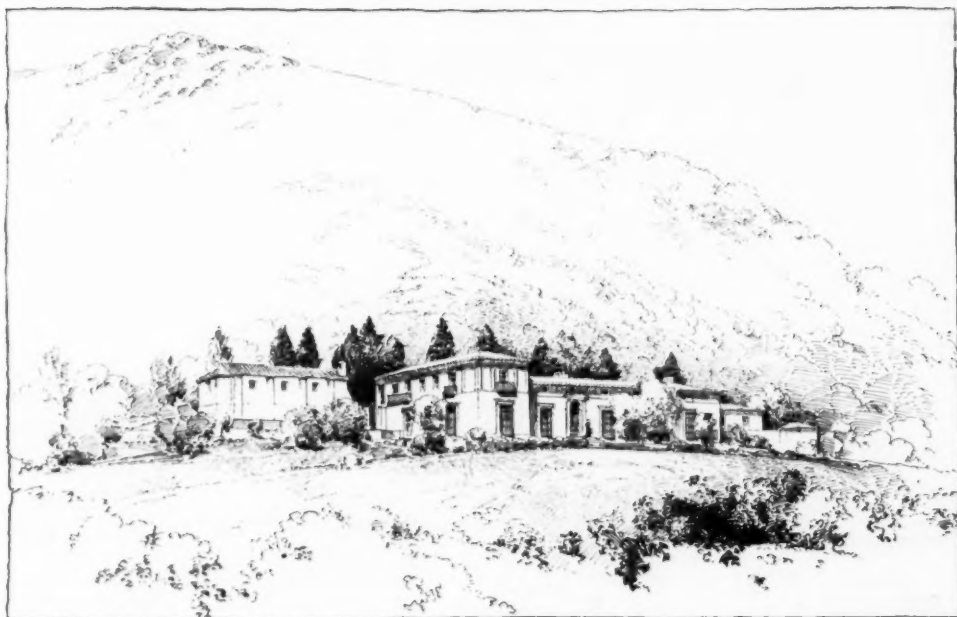
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THE CHAPEL. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



THE RESIDENCE OF MAJOR J H H PESHINE

SANTA BARBARA, CALIFORNIA



MYRON HVNT, ARCHITECT

By CHARLES OVER CORNELIUS

IN this age and country of eclectic art, the occasions are all too rare in which we find modern structures so thoroughly supported by a combination of historical influences in their mode of esthetic expression as is the house of Major and Mrs. Peshine in Santa Barbara, Myron Hunt, architect. Here the opportunity of following out traditions of family and environment has been accepted with a subtle appreciation, and the resulting work gives expression to many of the elements which go to make up one of the three so-called architectural styles which America may justly call her own.

The Spanish Colonial architecture, whose abundant and exuberant expression forms such a wealth of beauty in Mexico, is in some respects of greater importance than the wooden architecture of the east-

ern coast of the United States, with its English or Dutch inspiration. The use of monumental material gives it an impressiveness consistent with the fabulous wealth of its innovators; its frank response to the demands of climatic circumstance, and its utilization of the aboriginal craftsmanship of the conquered people, all aid to define it as the amalgamation of an indigenous artistic cultivation with an imported architectural style. This is in contradistinction to the history of our English Colonial, which is a development of a style imported from abroad, whose transplanted evolution was continued along well established lines, uninfluenced by any indigenous art but responding to more external differences of taste and usage or the necessity of adaptation of local material.



CHAPEL AND HILLSIDE BACK OF THE HOUSE. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA.
Myron Hunt, Architect.

Direct descendant from the Spanish Colonial, the Mission architecture which the Jesuit fathers brought into California is more nearly akin in its simplicity to the earlier Colonial of the East; for the political, religious or domestic requirements in both cases were not such as to lead to sumptuous or elaborate building. It has the inestimable quality which results from the use of local material and craftsmanship, of planning to suit climatic and topographic conditions and of unaffected response to utilitarian needs.

This house group in Santa Barbara is the confluence of the rich family tradition of Spanish-American nobility and of ever-strong Catholic faith, with their concomitant artistic expression fused in the crucible of a cosmopolitan but discriminating modern taste.

The location of the house is the unconscious *raison d'être* of the picturesqueness in line and grouping which characterizes

the exterior. Its low-lying length at the foot of the towering hillside is as inevitable in its contrast as are the tall spires and windmills of flat, monotonous Holland, or of the tower of Seville in its plain.

In its plan and elevation, the house proper falls into three units of usage, whose treatment in relation to one another is flexible and sure. The two-story block contains the bedrooms for family and guests, with baths and dressing rooms; in the long central portion are the more formal rooms—entrance hall, office, living room and dining room; while the service wing occupies the remainder of the group. The dwelling forms three sides of a patio, around which runs an open loggia; and the requisite seclusion and inclosure of a fourth side is supplied by the hillside, covered with virgin scrub, which raises its five hundred feet from the back of the quadrangle. The planting



GENERAL VIEW. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.

of the patio is purposely simple, and the spirit of the place will find its expression as the naturally worn paths spring up and occasional planting supplements the old trees and shrubs about which the house is built.

The dominating mass of the chapel is fittingly at the highest level, and from its elevation guards the lower units of the house and dependencies which stretch away to the west. There is approach to it equally from the street, the house and the garden; and in its embodiment of an undying religious devotion this accessibility to the many as well as to a few is of pleasing significance. This little house of worship, with its low-pitched roof, shallow buttresses and angelus belfry, has the solid and enduring structure of the early Mission chapels. The interior is correctly appointed from the front room to the altar, with the offices for the priest in the high basement story. The tunnel vault of the ceiling forms intersections with the window vaulting, and the three bays into which the room is divided are marked by broad arches flatly treated. The plastered walls and vaulting form a perfect setting for the richness of the woodwork, the wrought iron and the altar hangings, with their harmonious colorings, that play their appointed part in this union of the arts for the highest purpose to which they can be dedicated, the inspiration of religious devotion.

Aside from the more general aspect of the house, its picturesqueness of grouping and comely proportions, perhaps the most striking feature of the exterior is the spotting of the decoration in the spirit of its architectural ancestors. This concentration of ornament owes its success to the sparkling and abrupt contrast which the richly decorated units of the design make with the plain wall surfaces surrounding them. These plain surfaces in their turn enhance the beauty of the ornament by acting as a frame to shut out the surrounding elements which tend to distract.

The only sculptured decoration of the façade occurs about the doorway of the entrance, which is enframed by an ap-

plied Ionic order with its delicate capitals, and surmounted by the helmet, mantled and crested, of the family arms. The second story of the bedroom wing is marked by flat pilaster strips resting upon an unmolded string course, which is carried across the lower connecting blocks of the house to mark a sort of frieze. The principal decorative note is struck by the beautiful wrought iron work of the door, lanterns, window grilles and balconies. The painting of the ironwork a soft Spanish green serves, in the case of the windows and doors, to lighten the blackness of the openings, while in no way lessening the contrast of the balconies and lanterns with the almost white walls. The mottled red, yellow and bronze colorings of the roofs are pleasantly contrasted by this painted green with the gentle greens of the olive trees and the deeper tones of the palm-trees, the brilliant light fusing this array of contrasting color into one harmonious whole.

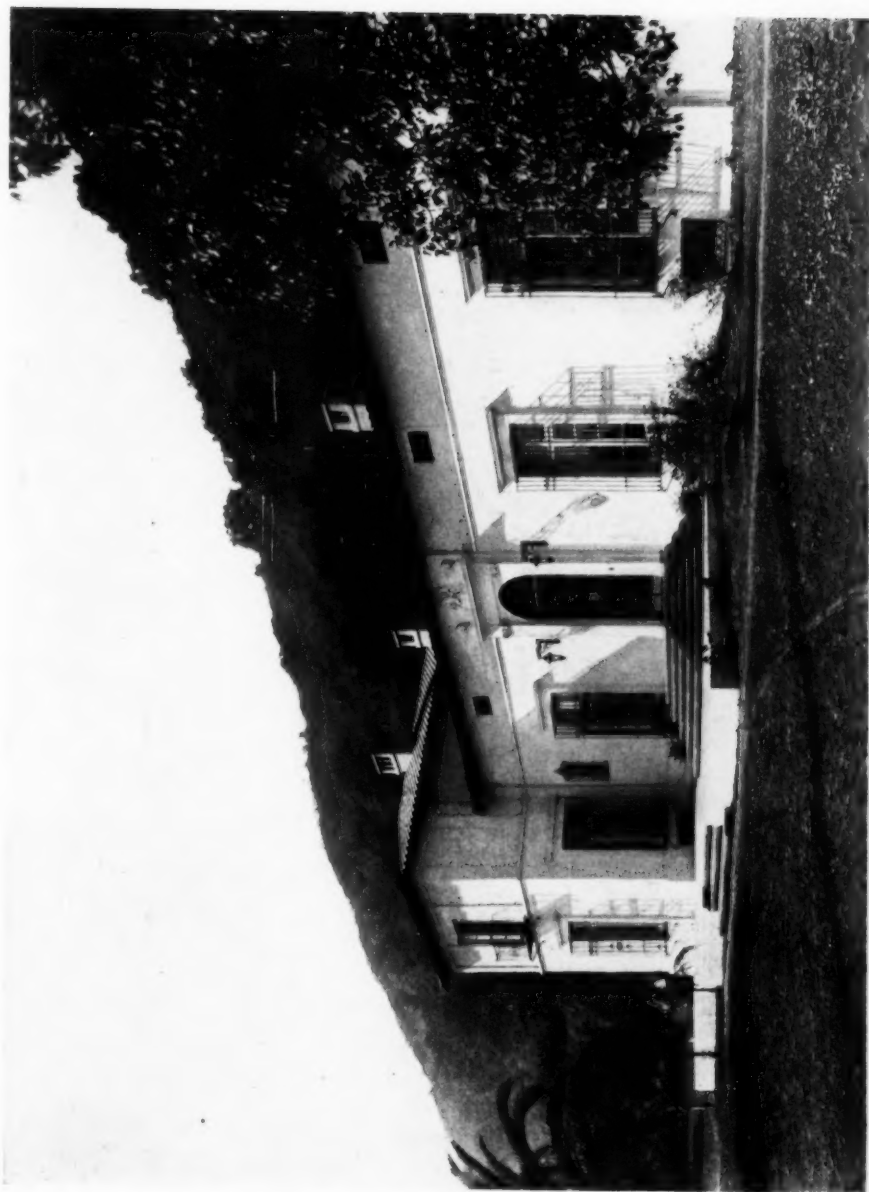
The patio, an outdoor living room, vaulted by the sky, is surrounded on three sides by the loggia, with its unadorned piers and bracket capitals, and forms the principal direct circulation for the building as a whole. The entrance hall runs through to this loggia, and a stairway leads from it to the tiny terrace before the chapel and to the guest rooms on the second floor. The imagination is stimulated by the pathways obliquing up the hillside and converging at the exedra fifty feet above.

The paved entrance hall is tall and vaulted, and its two arched doorways enframe the enchanting vista through the patio to the steps which lead up to join the hillside paths. It is from this entrance hall that the full beauty of the iron grilles of the doorway is appreciated, silhouetted as they are against the outside light.

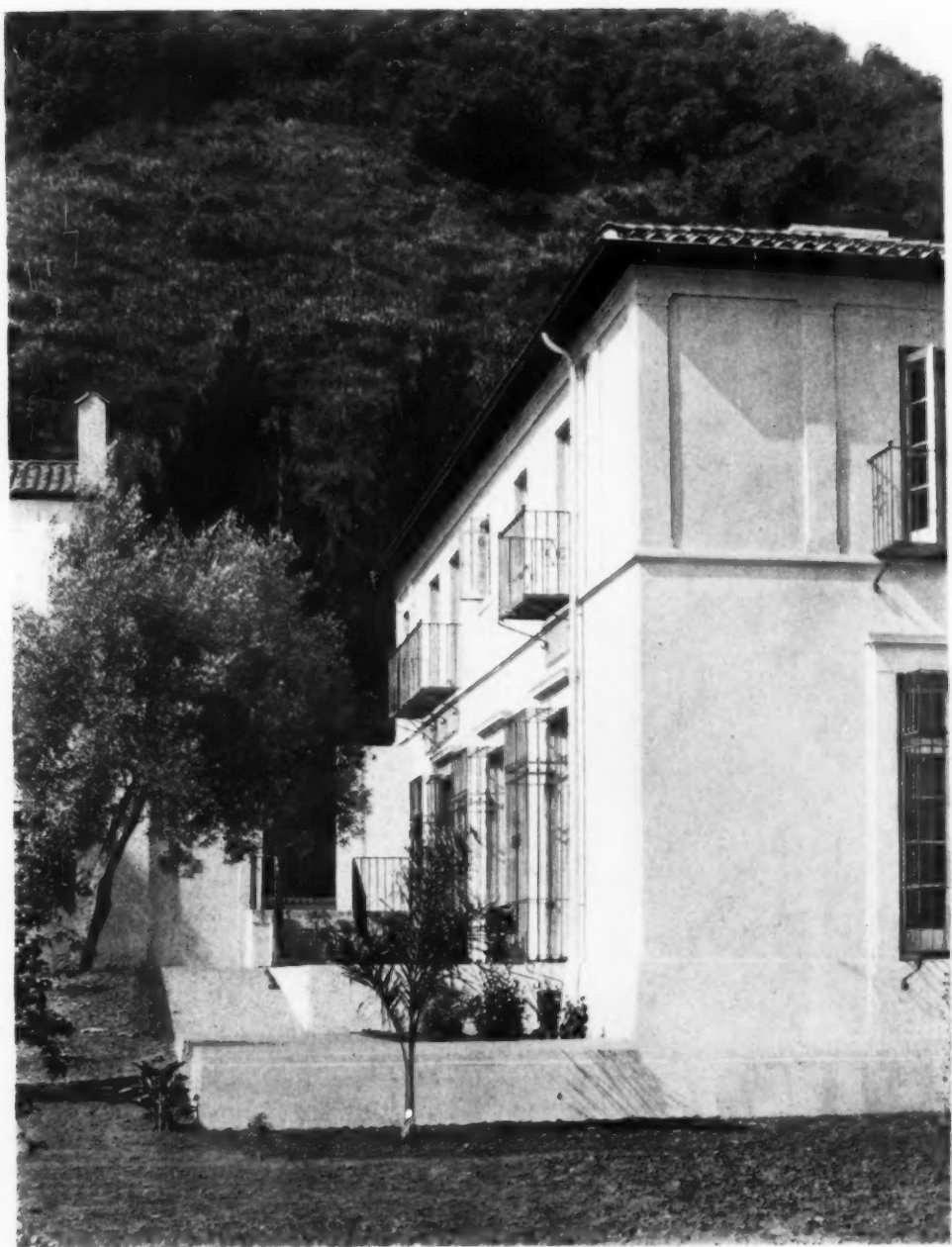
The living room, spacious and well proportioned, opens from this hall. The ceiling of this room is of heavy beams supported upon wall brackets, the space between paneled, and the whole glowing with color and gold. The simple plaster wall surfaces form an ideal foil for so



FRONT ELEVATION. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



ENTRANCE DOORWAY. RESIDENCE OF MAJOR J. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



HOUSE AND GATEWAY LEADING TO CHAPEL.
RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



CHAPEL. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



CHAPEL, WITH A GLIMPSE OF THE PATIO BEYOND.
RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



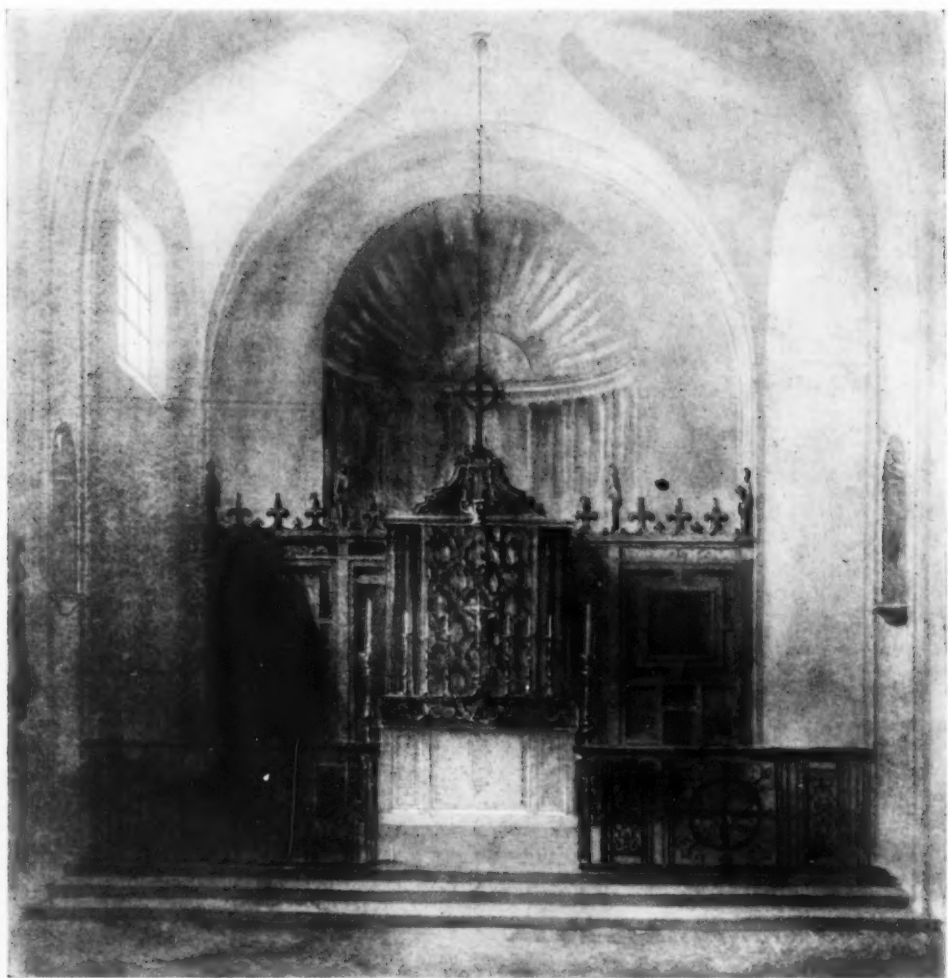
SECOND STORY WING OF MAIN HOUSE AND PART
OF THE CHAPEL, VIEWED FROM THE HILLSIDE.
RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



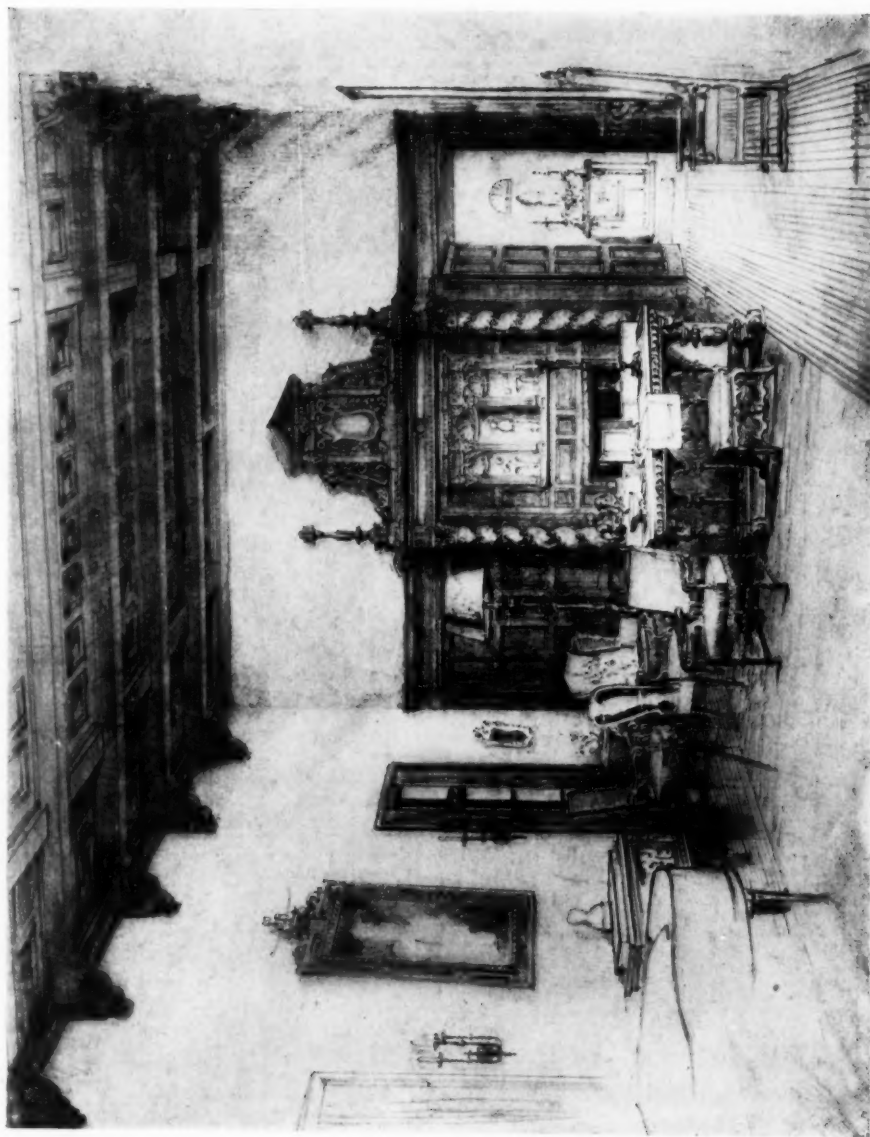
CORNER OF THE PATIO SHOWING ANCIENT OLIVE
TREES ABOUT WHICH THE HOUSE HAS BEEN BUILT.
RESIDENCE OF MAJOR J. H. H. FESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



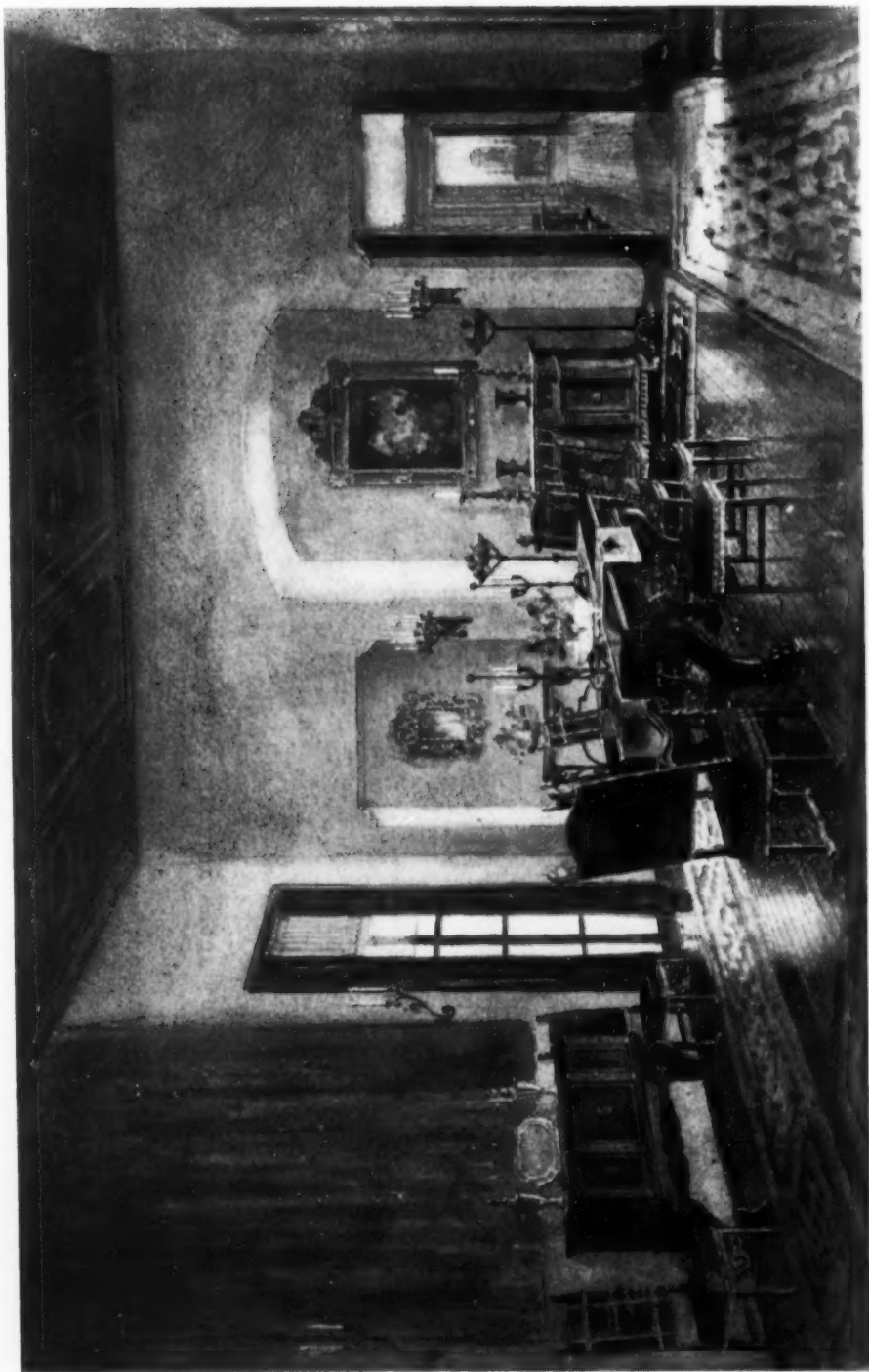
MAIN STAIRWAY TO SECOND STORY. RESIDENCE
OF MAJOR J. H. H. PESHINE, SANTA BARBARA,
CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR CHAPEL INTERIOR. RESIDENCE
OF MAJOR J. H. H. PESHINE, SANTA BARBARA,
CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR LIVING ROOM INTERIOR. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR DINING ROOM INTERIOR. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.

much richness both in the ceiling and in the elaborately treated fireplace wall, which is paneled high with an adapted Hispanic motif in dark and carven walnut. The design of this paneling, while containing many elements of Spanish-American ornament, is yet a very restrained treatment, in which good taste and logic have controlled the exuberance of such traditional design. The long windows admit the direct light from one side and the subdued light of the patio from the other.

In the dining room the richly paneled ceiling is flatter and less heavy, yet beautifully designed and executed; while the sideboard alcove is a dignified balance to the fireplace to which it responds. The vista from here through the living room into the hallway is focused in the almost altar-like setting at its end, possibly a trifle too ecclesiastical in its suggestion.

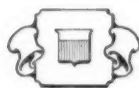
The arrangement of the breakfast porch bespeaks the semi-tropical climate, and separates the service wing effectively from the rest of the house; while the garage beyond is well out of the way, and activities there can scarcely disturb the quiet of the living portions.

In the design of modern buildings, most of which follow traditional architectural forms, the choice of the form is often difficult of decision. The per-

sonal predilection of a client for a particular style, the methods of building in a given location, the climatic or topographic conditions may each urge in a different direction; and it is always a matter for regret when the opportunity is lost to build in a manner in conformation with the custom of the country evolved through generations of local craftsmanship, and equally a matter for congratulation when the reverse is true. In certain portions of the United States no such traditions exist; but in the cases of Southern California, of Florida or of the Atlantic seaboard to the north, a very strong precedent has been established which is disregarded only at a risk.

It is the recognition of this fact in the design of the Peshine residence, the yielding to the Spanish-American momentum of the locality, where the echo comes back in the names of towns, of rivers and of mountains, which gives it its genuine individuality and character. Such a susceptibility to the inherent qualities of a locality, particularly when they fit in with family tradition and personal taste, is of the utmost desirability in the development of domestic architecture, the form of the art in which lies the possibility of this country's greatest contribution to the architecture of the world.

WAR MEMORIALS



By Ralph Adams Cram

THE impulse towards the erection of war memorials is instinctive and right; the deterrent lies in the fact that the whole world seems to have pretty much lost the ability to carry out its intentions after an acceptable fashion. The varied catastrophes that followed the Civil War are still vividly in mind and often conspicuously in the eye. If we are to see a new crop of granite columns braced by cast-iron goddesses; of smirking generals on bronze race horses; of miniature triumphal arches and tin soldiers, then the tragedy of the war will remain with us beyond its allotted time.

Just at present there seems to be a sort of concerted movement towards giving the proposed monuments a super-practical character—cleaning up slums, building model tenements, creating civic centers and the like.

Here again there is something good in the impulse, but it is apt to savor of shrewdness. Cleaning up slums is the duty of each community that possesses such institutions; and the idea of avoiding municipal responsibility by linking a neglected obligation with a patriotic impulse, of getting the thing done on sentiment rather than as a measure of justice, is not altogether appealing. Let these reforms be carried out by all means, and associated if necessary with the names of the dead and the victory they helped attain; but add, as always in history, some one visible monument that is marked by its beauty and impressiveness—and has therefore the highest value.

This does not mean the standard type of "monument" or statue, for there are many other possible forms. A bridge may be more beautiful and inspiring, even though the tendency has been of late in

exactly the opposite direction. For cities on the seaboard or the Great Lakes and rivers a boat landing may be made extraordinarily effective, with its marble steps, balustrades, masts, lanterns and statues. The American water-front is the most barbarous exhibit we have to offer, and a space of decency would be a relief. Fountains are in Europe amongst the most beautiful objects of art; with us they are few in number, generally ugly, and frequently dry. A triumphal arch, well designed, of sufficient size and impressively placed (an inconspicuous site between twenty-story office buildings does not fill the bill), still remains one of the most novel of memorials for communities that can meet the great expense. For small towns, a really fine flag-staff with a monumental base is as good a monument as one could ask.

Of course, the best and most significant memorial is the votive church; but what is the use of talking of this now when half the people are inimical or indifferent to formal religion, and those that remain over are divided amongst fifty-seven varieties of sects and would be prepared to fight to the death over the question whether the votive church should be administered by the Seventh-Day Baptists, the Plymouth Brethren, the Reformed Episcopalians or the Christian Scientists. There are, at times such as this, drawbacks in too complete "freedom of conscience."

No, the monuments must be secular; but if they are to exist at all, they must be the best. This means that we are bound to guard ourselves scrupulously against the commercial purveyors of mortuary art. What has happened in cemeteries in the way of family vaults, "Celtic crosses," symbolical statues and headstones, should give us pause. There

are just two people who can possibly produce what is wanted, the architect and the sculptor; and the committee that picks its type memorial from an illustrated catalogue (probably delivered by parcel-post) gets exactly what it deserves, even if the soldiers and sailors and airmen get much less. I am not sure but that it would be a good idea for the American Institute of Architects to approach the sculptors of the country with the idea of forming a committee that should put forward typical designs for possible memorials.

After all, what we do should be far more than local or even American in scope. The victory is over the enemies not alone of America, but of the world, and our allies have suffered and accomplished more than we. Should not then our own memorials take some cognizance

of what Great Britain and France and Belgium and Italy have done, and what they have endured? I am not very fond of replicas, but I sometimes think the best thing we could do would be to re-create in all the cities and towns of the United States some one of the destroyed monuments of France or Belgium or Italy. I do not mean Rheims Cathedral (though what a great idea that would be!) or the Cloth Hall of Ypres, but some chapel or château or bridge that should stand always as an example of what the universal enemy destroyed when he could get the chance, and as an evidence of what our men went abroad to save, and did save—the fine spirit of true civilization that showed itself once in art such as this, and has been preserved, that it may show itself again.

HOUSING PROJECT SCHEDULES



By N Montgomery Woods

A HOUSING project, or in fact any operation involving a considerable number of buildings, of many designs and sizes, and of varying combinations of materials, may become the source of endless confusion and bewilderment unless the plans are accompanied by some sort of a schedule sheet which will furnish as far as possible the information that will be required by all of those who may be interested. This will include the owners, and those who may assist in the financing; the designers, both architectural and engineering; the estimators of materials and costs; the builders, superintendents, foremen and workmen who engage in its construction; and, finally, the agents in charge of the rental or sale of the finished property.

Those of us who have had the experience of being handed a roll of blue prints of fifty pounds or more, representing some large number of houses (just how many was not stated); of certain varying types (the nature of which had to be gathered by looking over a hundred or more sheets); and located on a large tract of land on various blocks and lots (neither of which were numbered), will thoroughly appreciate the value of having someone place everything we need to know on the top sheet of the set of plans, so that without turning a page we may find a detailed statement or a brief summary, whichever we may wish, of just what the whole thing is about.

It is all so plain to those who have laid out the scheme that they are apt to overlook the fact that anyone unfamiliar with the particular project may find it necessary to ask scores of questions, which might be easily answered by the architects if they were present, or which may be figured out from the plans if some hours are spent in going over them; but which, in any event, will involve much waste of time and effort

Also some system should be adopted by which it may be readily ascertained whether or not the set of drawings given you is complete, and whether or not some one or more of the sheets have been abandoned or superseded. Hardly any building proposition ever goes through to completion without some alteration in the plans being made, and it is an imposition on anyone to allow him to spend his time upon a set of plans which he afterward learns are incomplete or out of date.

Such a need being apparent, the form illustrated herewith was prepared by the writer during the past summer, and has been adopted and used by the United States Shipping Board Emergency Fleet Corporation on all of their subsequent projects, and for revised schedules on all of their previous ones.

To use any form, some system of notation must be adopted, and the one determined upon for use in the schedules referred to may be described as follows:

First, regarding the indexing of drawings, the schedule sheet is No. 1, and is placed on top of the set, all sheets of which are made the same size, if possible. In the lower right hand corner of each sheet is its number, in very prominent type, so as to require no effort to locate it. Then, on the schedule sheet, is an "Index of Drawings," in which is given a complete list of all drawings for the project, of every kind and description, even though some of them may have been superseded or abandoned. If such is the case, list them anyway, and make a note to that effect, so that even though someone may have such a sheet he will waste no time on it.

This schedule sheet is dated, as are all the other drawings, and on the index at the bottom of the list of drawings, a space is left for listing any subsequent drawings. These are to be added to the

APARTMENT 5

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·BUILDING·TYPES·

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EXPLANATION

[illegible]

TYPICAL: PDO, IFCT:

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6 " " " 30	10 " " " 200	2	12 UNITS
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3 ROOM APARTMENT UNIT# 24	4 AFTER COUNSELING 1 UNIT# 200	2	200 UNITS
6 " " " 30	4 " " " 200	2	200 UNITS
TOTAL APARTMENT UNITS 112	COMPLAINING 40		
TOTAL UNITS 312	107 COMPLAINING	112	112

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INDEX OF DRAWINGS

- SHEET - NO 1 THIS SCHEDULE
 2. PLOT PLAN
 3. 6.8 (MIL) BLOCK PLANS
 4. 9.16 22 (MIL) PLANS & ELEV OF HOUSES
 5. 23.16 24 (MIL) " " " " APARTMENTS
 6. ETC

DATE	SHEET NO	DESCRIPTION
		SUBSEQUENT DRAWINGS TO BE LISTED BELOW

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schedule as they are completed, and new prints of the schedule sheet made and sent to all those interested.

In order to determine just what information should be supplied on the schedule sheet, we must first place ourselves in the position of the various interests who may be likely to require such information, and endeavor to arrange our sheet so as to place just in front of each inquirer the concise answers to his various questions. This brings up the questions, who will be interested in knowing these many things regarding the project, and just what information will they be likely to require?

These may be given as follows:

(1) Assuming that the project is financed by the Government, as has been the case in most of the recent instances, the department heads having charge of the financing and the general management of the operations will at times wish to obtain general information, such as the total number of house units, the number of groups, and the proportion of 4, 5, 6 and 7 room units; the number of unit types and the number of group types; the number of detached house units, of semi-detached house units, and the number of rows of 3, 4, 5, etc. This may be all they want to know at the time, so it seems advisable to give a brief summary in a separate rectangle on the sheet, in order that this information may be readily found without having to study the whole sheet. This has therefore been shown at the bottom of the sheet in the center, where similar information regarding any apartments or other buildings contained in the project is also to be found.

(2) The project supervisor, town planner, contractors, building foremen, etc., will want to know many things in addition to the above, such as the exact location of a given unit on the map, its position in a group, right or left hand, its variation of materials, the number of times it occurs in the block and in the entire project; the number of rooms it contains, its area and cubage; and the exact difference between its design and construction and those of some other type closely resembling it.

(3) The estimator who figures the quantities of materials and labor necessary to erect the houses must ascertain first the number of basic types of house units involved, and the architect should advise him just what these basic types are, and also regarding all the minor variations of each; listing in a separate column each type of house unit which is unlike the others, regardless of how trivial may be the difference. This being done, the estimator may proceed to do his figuring with much less chance of error than where he has been forced to prepare his own schedule—something he must do before beginning his work, unless the architect has supplied all of the required information with accuracy and completeness.

(4) The real estate agent or others charged with the rental or sale of the finished houses will want to know the number of end houses and the number of interiors; the interior houses having of necessity much smaller yards and much less light and privacy, the rentals or sale price will be correspondingly lower. This department is also interested in knowing just what other buildings, such as stores, schools, etc., are included in the project, besides much of the other information mentioned above.

To lay out such a schedule, the procedure would be as follows:

The property is first divided into blocks, by which is meant areas bounded by streets; and these are numbered consecutively 1, 2, 3, etc. Then each block is divided into lots, numbered each by three figures, the first being that of the block number. For instance, in Block 6 the lots are numbered 601, 602, 603, etc., so that when a lot number is mentioned the block in which it comes is known at once.

The individual dwelling, to be occupied by one family, is called a house unit, whether it be a detached house, half of a semi-detached house, or one of the units composing a row of three or more. Much confusion has been caused by the use of the words "house" and "building," some taking them to mean, for instance in the case of a semi-detached house, one-half of the structure; while others have interpreted them to mean both units taken

together. Therefore, in order to avoid this chance for error, the term "group" has been adopted to mean a separate structure, whether it be a detached house, a pair of units built attached (a semi-detached house), or a row of three or more.

The unit types are classified, and each one listed in a separate column, regardless of how trivial may be their differences. The capital letters where used in connection with the houses denote the number of rooms contained in the house unit, as follows:

A=4 rooms, B=5 rooms, C=6 rooms, D=7 rooms, etc.

Where two or more house units occur, each containing the same number of rooms, but differing greatly in other respects, such differences are designated by adding the small letters, a, b, c, etc., and such units are called basic types. Then, where a basic type is used in two or more minor variations (such as, for instance, the changing of a porch from front to side), such differences are designated by adding the numerals 1, 2, 3, etc.; and at the head of each column where such variations are listed there is given a brief statement of the differences between these types and the basic type from which they are taken, for example, "Same as A1 except," etc. Thus "Ab2" designates a 4-room house unit, of the basic type "b," and of the particular variation "2." House units are usually used with the plan in some instances reversed, so that the columns in which each are listed are divided into two parts, right and left, abbreviated "R" and "L." Then, as a variety of material combinations are usually employed, the right and left hand columns are further divided into as many parts as there are material variations, and these are designated by the small letters at the end of the alphabet, x, y, z, etc., and a key given below to show their meaning.

The various combinations of units into "groups," whether groups of one unit or of two or more, are shown under the head of "Group Types," and are numbered in Roman numerals, I, II, III, etc., to avoid confusion with the individual group numbers, which are in Arabic

numerals, 1, 2, 3, etc. For instance, in Block I there are four groups, numbered 1, 2, 3, and 4. No. 1 is of Group Type IV, which is a group of three units, as follows: Ba1 L, Ba1 R, and Ca1 L.

At the bottom of the unit columns we find the total number of groups, number of units of each type, number of left and right hand of each type, and the number of each material combination of each type. Also the number of each basic type and its variations are added together so that, for example, in estimating the heating on the Ab1 house units, of which there are 14, if Ab2 differs from Ab1 only in that the porch is moved from front to side of the house, then the heating on Ab2 need not be figured, but Ab1 figures simply multiplied by 30, the number of Ab1 and Ab2 units combined.

Then is found the total number of 4, 5, and 6 room units and the total number of house units in the project. The area and cubage of each unit is given, the area and cubage of the total number of each type, and of the total number of house units in the entire project. Thus in a few minutes it is possible to obtain a fair estimate of the cost of the project by multiplying the total areas or cubages by the proper price per foot. As there are hardly two men who figure areas and cubages on precisely the same basis, a statement is given under the "Explanation" as to the exact manner in which these are taken.

In the columns where units are listed the sheet numbers on which the plans may be found are given, so that no time will be lost in locating any drawings required.

If a portion of the housing facilities are in the shape of Apartments, a corresponding list of questions may be asked; and the form shown herewith gives a satisfactory method of supplying the necessary information, which will probably be clear without explanation.

A general "Explanation" is given on the schedule sheet for the benefit of someone who may wonder why a system is used which is apparently somewhat complicated. The answer is that the number of items to be incorporated is large, and an ounce of "complication"

will save many pounds of confusion and error.

To utilize such a schedule successfully it is, of course, necessary to see that all of those engaged in the design of the project are working on the same basis, and are laying out and numbering the various items accordingly. Therefore, all drawings from beginning to end, including plot plan, block plans, as well as all architectural drawings, should bear the adopted notation.

Unfortunately a project is rarely ever definitely determined upon until it is practically completed. Therefore, it is extremely desirable to assume at all times that changes will be made. Accordingly extra columns and other spaces had best be allowed for when laying out the sheet, in order that additional blocks, lots, unit types, and group types may be added at any time, without necessitating the redrawing of the entire sheet.



GENERAL VIEW CHAPEL AND HOUSE—MAJOR J. H. H. PESHINE'S RESIDENCE, SANTA BARBARA, CALIFORNIA.

Myron Hunt, Architect.

(For additional illustrations of this house see leading article in this issue.)



COTTAGE GROUP IN THE LORDSHIP MANOR DEVELOPMENT, BRIDGEPORT HOUSING CORPORATION.

THE GOVERNMENT'S HOUSING AT BRIDGEPORT, CONNECTICUT



By Sylvester Baxter

THE undertakings of the United States Housing Corporation at Bridgeport, Connecticut, are typical of the general requirements of a great industrial city, fairly swamped by the demands for dwellings made by the workers who flocked in to meet the needs of manifold industries flooded with war-orders. Bridgeport, one of the great seats of war-industries, was well along in the hundred-thousand class in population years before the war began. The increase since the war has been so enormous that it would be difficult to estimate the city's present size.

Before our country entered the war the orders from the Allies for munitions had been so great that the managements of the various local industries found that the law of supply and demand could not be depended upon to meet the urgent need for housing. It was seen that without the accommodations required for a class of well paid and high-class workers, a high-grade force could not be depended upon; the workers would be essentially a

floating population, here to-day and there to-morrow, according to the attractions of the various industrial centres, all competing for help and doing their best to draw the best labor to themselves. The problem was mainly to get the skilled workers there and to keep them there.

Fortunately the ground had been well prepared for carrying on the work of meeting these needs, and only when the task proved beyond the capacity of private means did it become necessary for the Federal Government to undertake the work on a vast scale. The manufacturers themselves had set out to supply the demand for housing when it became evident that without collective action of some kind the situation was hopeless. John Nolen, of Boston, widely known as a town planner, had been commissioned to investigate the subject. His report, "More Homes for Bridgeport," was carefully considered by a special committee of the Bridgeport Chamber of Commerce. In consequence the Bridgeport Housing Company was incorporated,



FINISHED COTTAGE AT BRIDGEPORT, CONNECTICUT.

with a capital of one million dollars, and work on a large scale was promptly begun. Several sites in various sections of the city and its neighborhood were carefully prepared for development; both apartment-houses and group-houses were promptly built in substantial and model fashion, and 200 or more families were accommodated. Still more extensive activities were undertaken by a single great manufacturing corporation, the Remington Arms Company, providing for the housing of 700 families. Together with the housing-work of the Federal Government, the total expenditure for new industrial housing in Bridgeport since the beginning of the war will amount to about \$8,000,000. With a very few exceptions all of these homes are of brick, with roofing of slate or asbestos shingles.

When it became evident that private resources could barely begin to do what was necessary, the large-scale operations of the Federal Government, set on foot not many months after America had entered the war, were greatly facilitated by what the local housing projects had already accomplished. The organization for the more extensive operations to no

little extent already existed. Mr. R. Clipston Sturgis, the Boston architect, distinguished for notable public work of a monumental character—including that noble Greater Boston landmark, the Perkins Institution for the Blind at Watertown—as well as for domestic architecture of a peculiarly intimate charm, had been in charge of the work for the Bridgeport Housing Company from the start, and knowing the ground so thoroughly, he was the right man for the larger undertaking.

The industries of Bridgeport are scattered all through the city. Hence, unlike most other projects undertaken by the United States Housing Corporation, the Bridgeport work is not concentrated upon one compact area, forming a neighborhood or separate suburb by itself, but is divided into five different developments. This brings each development into the neighborhood of factories, so that the workers in no case are more than a few minutes' walk from their work and do not have to depend upon transit facilities. Another feature is that all general accommodations for community needs—schools, playgrounds, parks, shops, and amusements—are furnished

in the city at large, so that all the Housing Corporation's outlays are concentrated upon the housing pure and simple.

It should here be said that besides Mr. Sturgis, as chairman and architect, the committee of designers in charge of this Bridgeport project consists of Mr. Arthur A. Shurtleff, of Boston, as town-planner and Mr. Alfred H. Terry, of Bridgeport, as engineer. Mr. Shurtleff has to his credit one of the most extensive and comprehensive examples of town-planning in the history of the profession in this country—the important metropolitan plan for the development of Greater Boston, upon which was based in great part the notable report of the Metropolitan Improvements Commission of 1909.

II.

There are five of these separate tracts

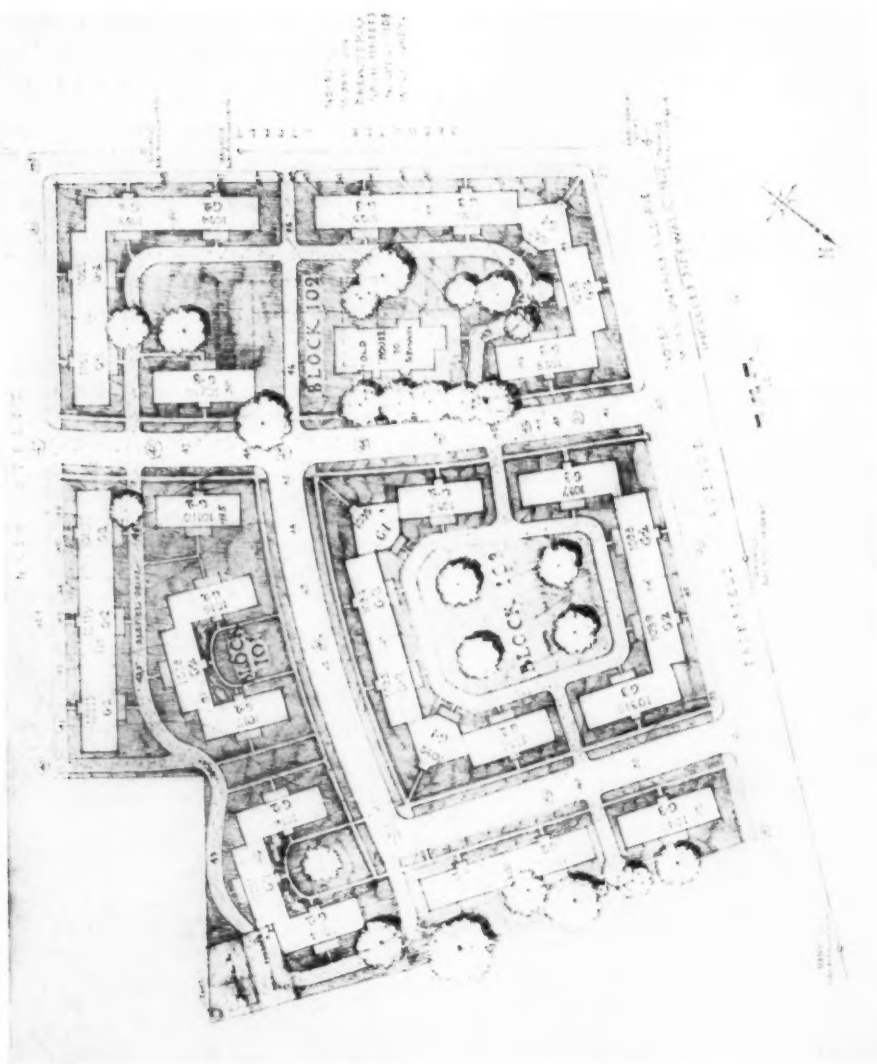
in as many quarters of Bridgeport. They have the character of "town sites" or additions, within a city. They each comprise what has either been vacant land or parts of what have been more or less sparsely occupied residential sections. Two are comparatively small urban tracts; these have been given a compact treatment appropriate to the environment, covered with model apartment-houses that accommodate without congestion a large number of families. All the five tracts, with one exception, have certain attractive natural features in the way of trees or agreeable bits of landscape with picturesque ledges, which have been made the most of in the pleasingly, as well as economically, developed plans for the several properties.

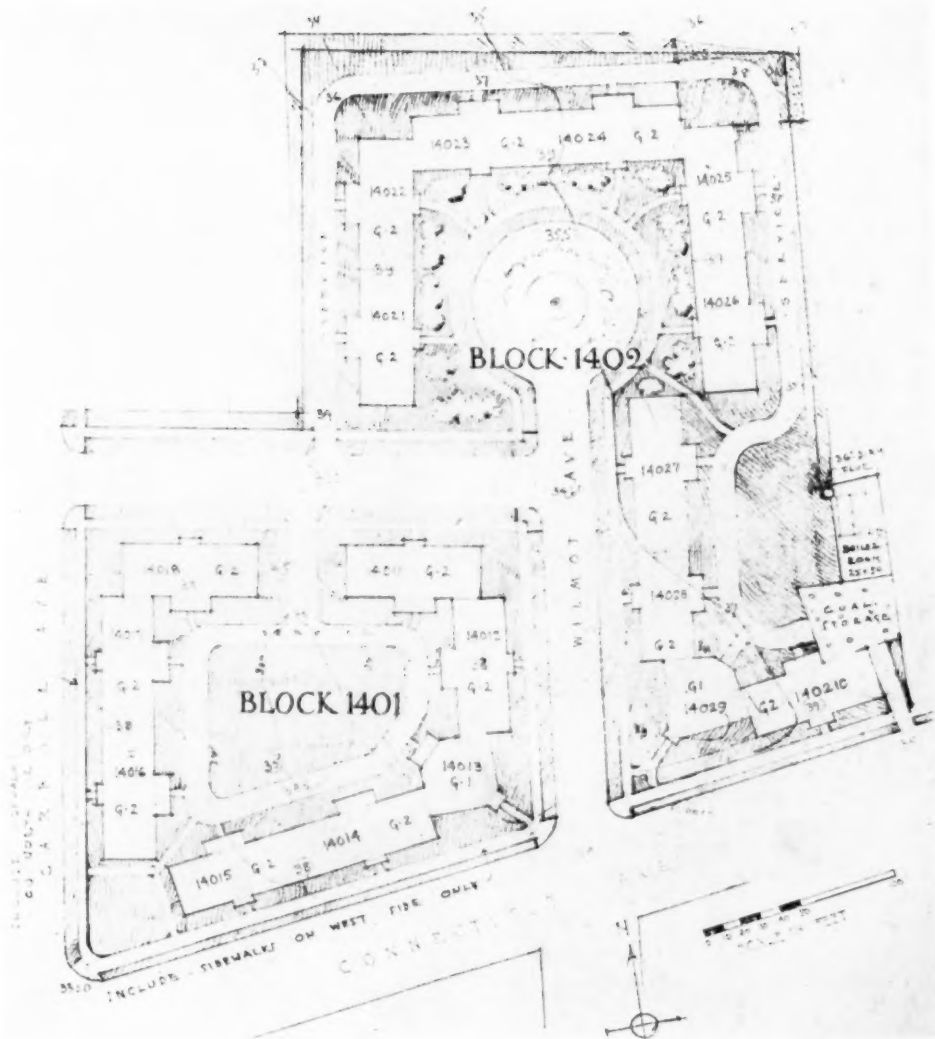
Was it not Napoleon who, in conducting one of his great military operations,



A BACK YARD AT BRIDGEPORT, UNDER CULTIVATION.

The division fencing of wire netting is the general rule with the Housing Corporation.





THE CONNECTICUT AVENUE DEVELOPMENT (URBAN AND APARTMENT HOUSE) OF THE U. S. HOUSING CORPORATION, BRIDGEPORT. LAYOUT FOR THE GROUP.

Note the way in which Wilmot avenue is brought into the property, terminating in a circle inclosed by a quadrangle.



THE OLD MILL GREEN DEVELOPMENT (SUB-URBAN) OF THE U. S. HOUSING CORPORATION, BRIDGEPORT. LAYOUT FOR THE GROUPS.

The design of this tract was largely governed by the existence of picturesque ledges, tree-groups and wild shrubbery. It was the aim to preserve these features to the best advantage.



THESE TWO PLATES SHOW TYPICAL SINGLE AND TWO-FAMILY HOUSES DESIGNED FOR THE OLD MILL-GREEN DEVELOPMENT.

changed the course of an important route to spare a tree? A like consideration has been shown in planning for this epochal class of government work; the lines of roads and the layout of house-groups being modified not for the sake of obtaining an arbitrary picturesqueness in effect, but primarily for sound economic reasons—sparing trees, groups of trees, ledges, and other desirable and valuable elements of beauty, instead of ruthlessly and expensively slashing and blasting a way through them for the sake of a grid-iron monotony—a procedure that has earned for too many engineering operations the name of “landscape butchery.”

III.

The two tracts of distinctively urban treatment are respectively the Black Rock development (Group No. 1) and the Connecticut Avenue development (Group No. 2.) These properties are occupied by apartment-houses of three stories

each, built of brick, relieved by cast stone sparingly used. The units are designed in groups, disposed in rows or courts, thus combining with economy in construction a pleasing variety in appearance. In case of the courts, the effect is not unlike that of a college quadrangle. In these apartments each unit is planned with two stairways; two families are accommodated on each of the three floors. The greater number of these apartments are designed with four rooms: kitchen, living room, two bed rooms and a bath. The others have either three rooms or five rooms—about an equal number of each class. The needs of families of varying sizes are thus well met. In all cases the living room is also available as a bed room, if need be. With such devices as folding beds or convertible lounges, the same room may easily serve as both living room and bed room.

The conveniences have been thought-

fully studied with a view to economical construction; a standardized plumbing scheme for all the apartments, for instance, makes possible an excellent installation at minimum cost. It should be said that both apartments and single or semi-detached dwellings in this Bridgeport project—with the exception of one development—are designed to meet the best demands of a class of highly skilled, and correspondingly well paid, mechanics, able to pay rentals of from \$20 to \$35 a month; a class that commonly appreciates the elements of good looks and domestic comfort in surroundings. Great care has therefore been taken to meet these requirements in a way that makes these developments—disposed as they are throughout a large New England industrial center—a model of their kind; an invaluable asset to the community, enhancing the beauty of the city and setting so high a standard of convenience, comfort and taste as inevitably to encourage a demand among working-people of this class that will hereafter not be easily satisfied with anything less than "something just as good" in the truest sense of the term. Such leaven can hardly fail to work. And what a contrast to the jerrybuilt wooden three-deckers and two-flatters, in which workers are so often deluded into investing their good savings, are these substantially handsome and dignified apartments and equally substantial individual dwellings, enduringly built, beautifully cosy and garden-embowered! The

attention given to these qualities is a great economic as well as esthetic factor. Improvements of this character greatly enhance surrounding property values and create for a municipality most welcome additions to its taxable resources. On the other hand, it is related of one of the largest of New England industrial cities that when an unoccupied tract was "improved" with wooden three-deckers, the result was such a depreciation in neighboring properties that the appraised values of that entire section were less than they had been before.

From the foregoing it may be seen how exceedingly worth while is the attention given to artistic aspects in developing these properties. One of these urban properties, the Black Rock development, has a fine group of trees. These, carefully preserved, will at the start greatly enhance the appearance of the architectural group that occupies the premises. The other urban property, the Connecticut avenue development, is without natural features of this sort and must wait for them to be provided before the design in its best intentions can be fully realized. In all the properties, both urban and suburban, due attention is paid to giving the buildings a pleasing setting of tastefully designed grounds, simple and economical to maintain, and making the best of existing natural features.

IV.

There are two suburban developments:



HOUSES DESIGNED FOR THE OLD MILL-GREEN DEVELOPMENT.



HOUSE FOR THE GRASSMERE (SUBURBAN) DEVELOPMENT.

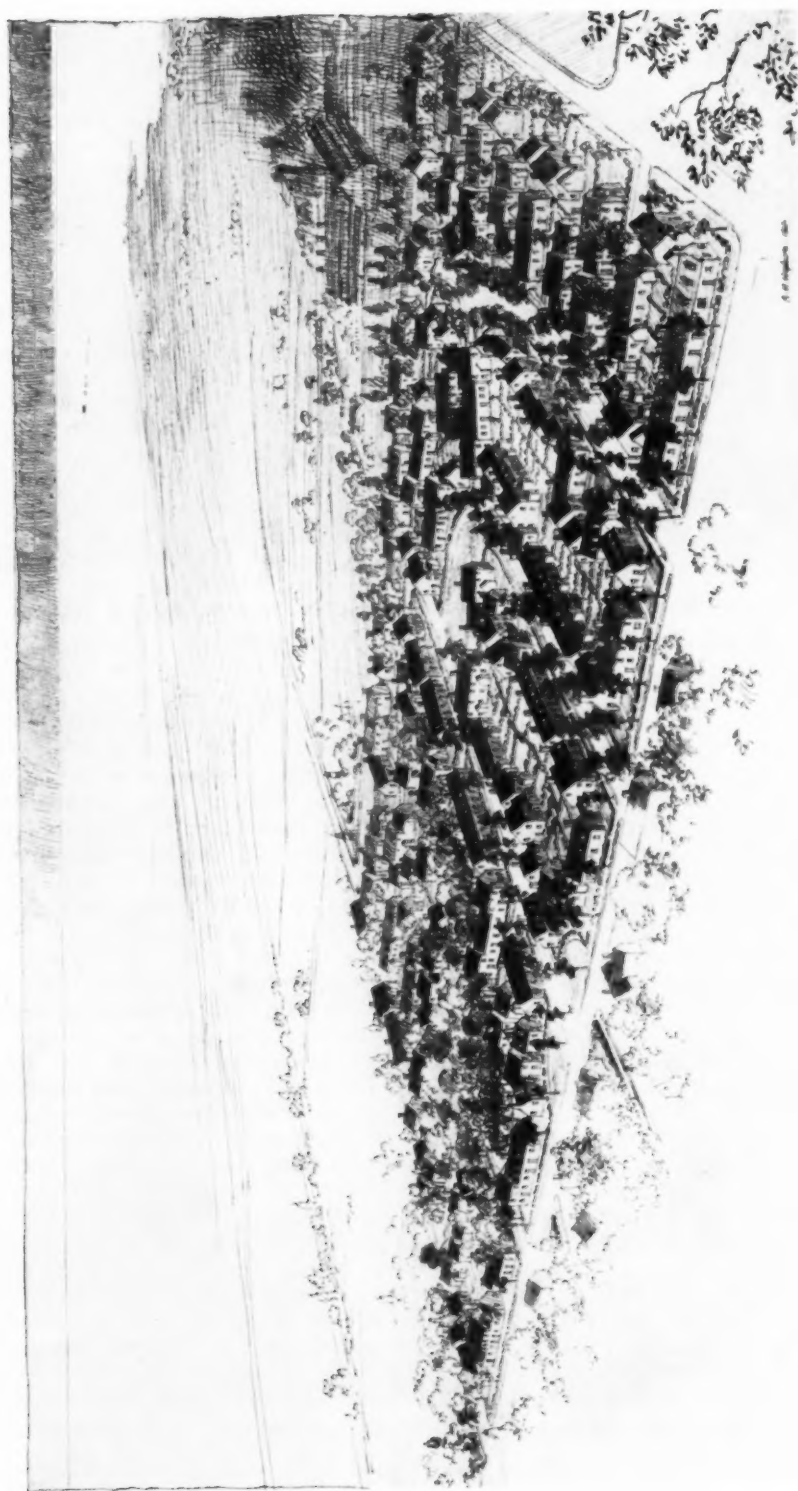
the Grassmere tract is close to the line between Bridgeport and the neighboring town of Fairfield; and the Mill-Green is on the historic Boston Post Road, near the Remington and the U. M. C. works.

The general effect of both of these tracts is that of a "garden-city" development that resembles the English type, though in architecture it has a distinctively New England character. The charm of the Mill-Green development is augmented by its natural features; picturesquely varied surface-contours with rocky ledges clothed with wild growths and accented by many pine trees in clusters. The grouping of the buildings has been planned with regard to the preservation of these features and making the best use of them in the design. Both of these suburban developments are occupied by groups of single houses, double (semi-detached) houses, and two-family houses (one family below, the other above) on individual lots. All the houses are of brick with slate roofs, some a story and a half high and others two stories. There are four to six rooms in each unit. These organic differences bring into play a diversity of types that give opportunity for much freedom of treatment and composition in the groupings of different

shapes and sizes. Every family is provided with its own plot of land, whether living in a single, double or two-family dwelling. The ways in which the requirements in this particular are met, by designing the layout of the land according to the house-plan, are admirable. In each case there is a small front yard with hedges and with shrubbery enough to leave a minimum of lawn-space to be kept in order; then there is a paved service-yard, so planned as to give room for a garage; and thirdly, a space for a house-garden.

In general these two suburban developments are along lines already followed in the work done by the Bridgeport Housing Company. Last summer, in the developments completed for that company, many of these gardens were filled with vegetables and fruit. It should be noted that the Bridgeport Housing Company was formed to meet the housing demands created by the war. The interests that organized it represent a large proportion of the establishments engaged in war work and correspondingly interested in the welfare of their employees.

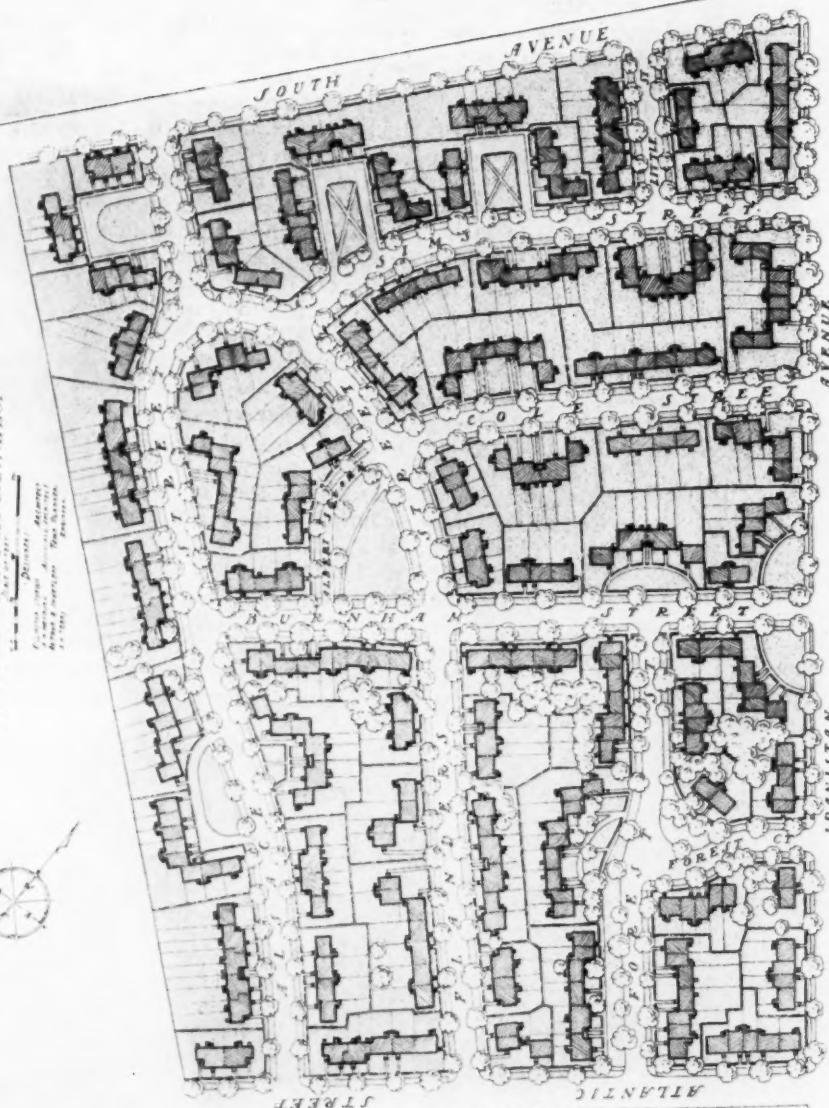
The aspect of these developments is that of a residential section occupied by prosperous and well informed middle-



BIRD'S EYE VIEW OF THE CRANE DEVELOPMENT,
U. S. HOUSING CORPORATION, BRIDGEPORT, CONN.

BRIDGEPORT - CONNECTICUT
 GENERAL PLAN FOR CEMETERY

Scale of 1/4" = 100' - 1/8" = 50' - 1/16" = 25'
 1/2" = 100' - 1/4" = 50' - 1/8" = 25'
 1/16" = 12 1/2' - 1/32" = 6 1/4' - 1/64" = 3 1/8'



1/2" = 100' - 1/4" = 50' - 1/8" = 25'
 1/16" = 12 1/2' - 1/32" = 6 1/4' - 1/64" = 3 1/8'

class people. And should any of the well paid skilled workers who have the good fortune to occupy these model homes, in their domestic habits not belong to the usual New England class of intelligent artisans, the powerful influences of neighborhood example and the instinctive human impulse to live up to one's surroundings can be depended upon to make them so eventually.

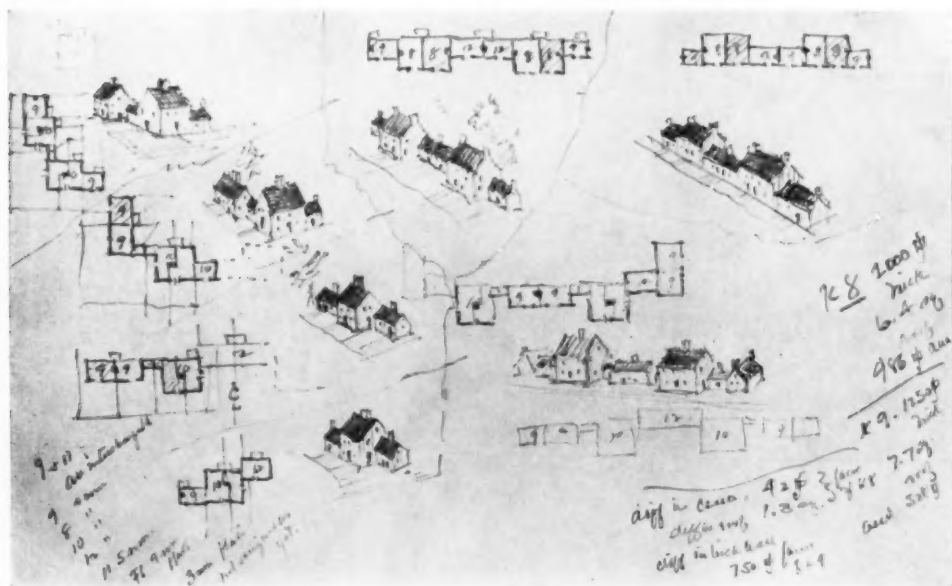
In both of the urban, or apartment-house, developments the layout of the tracts shows what can be done with comparatively small and level properties in the way of individual interest obtained by unstereotyped planning. In the Black Rock property this effect of individuality has been enhanced by the existing trees, the location of which has been a factor in shaping the plan and determining the grouping of buildings. The principal group here is a large quadrangle, its ten units enclosing a court with handsome great trees growing in a lawn. This court is entered by a service road from the street without. The court also gives the advantage of quietness to the surrounding apartments. The apartments at the corners are ingeniously planned with reference to their position. All the other

buildings stand either in connected groups of three about a court open to the street on the fourth side, or in rows facing the streets that traverse the property or border it.

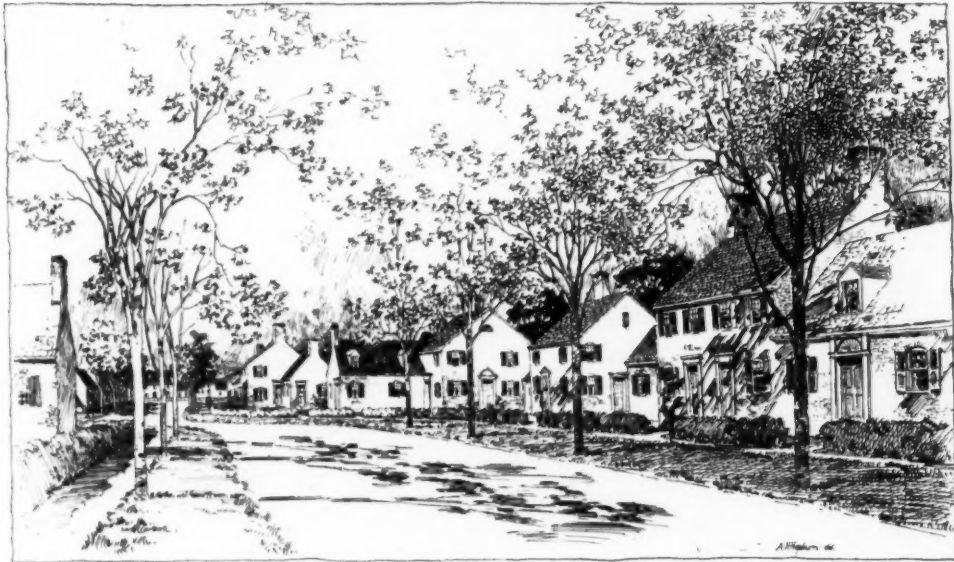
All the units, both in the Black Rock and the Connecticut avenue property, house six families each in quarters varying in size from three to five rooms. Altogether there are 33 units, accommodating a total of 198 families.

The Connecticut avenue development has 18 units. Two of the blocks are occupied by as many quadrangles. In one of these the houses are built around the four sides of a court, similar to the quadrangle in the Black Rock development. In the other block, where the buildings occupy three sides of a large court, the layout is made strikingly handsome by the way in which Willow avenue, one of the public streets of the city, is brought into the property and there, as it ends in a circular drive, terminating an agreeable vista of dignified architecture.

In the Mill-Green tract on Boston avenue the main property has five blocks disposed in an irregular development of streets deflected from straight courses



SKETCHES FOR GROUPING. CRANE DEVELOPMENT, BRIDGEPORT.



TYPICAL STREET PERSPECTIVE. CRANE DEVELOPMENT, BRIDGEPORT.

on account of topographical conditions, such as contours and desirable natural features well worth preserving. This irregularity in plan accommodates movement with greater directness than would a conventional rectangular layout. There is also a "cemetery extension" of this property: a level tract with a rectangular plan, the streets dividing it into four blocks. The plan of the level Grassmere tract, near the Fairfield line, is divided into seven rectangular blocks.

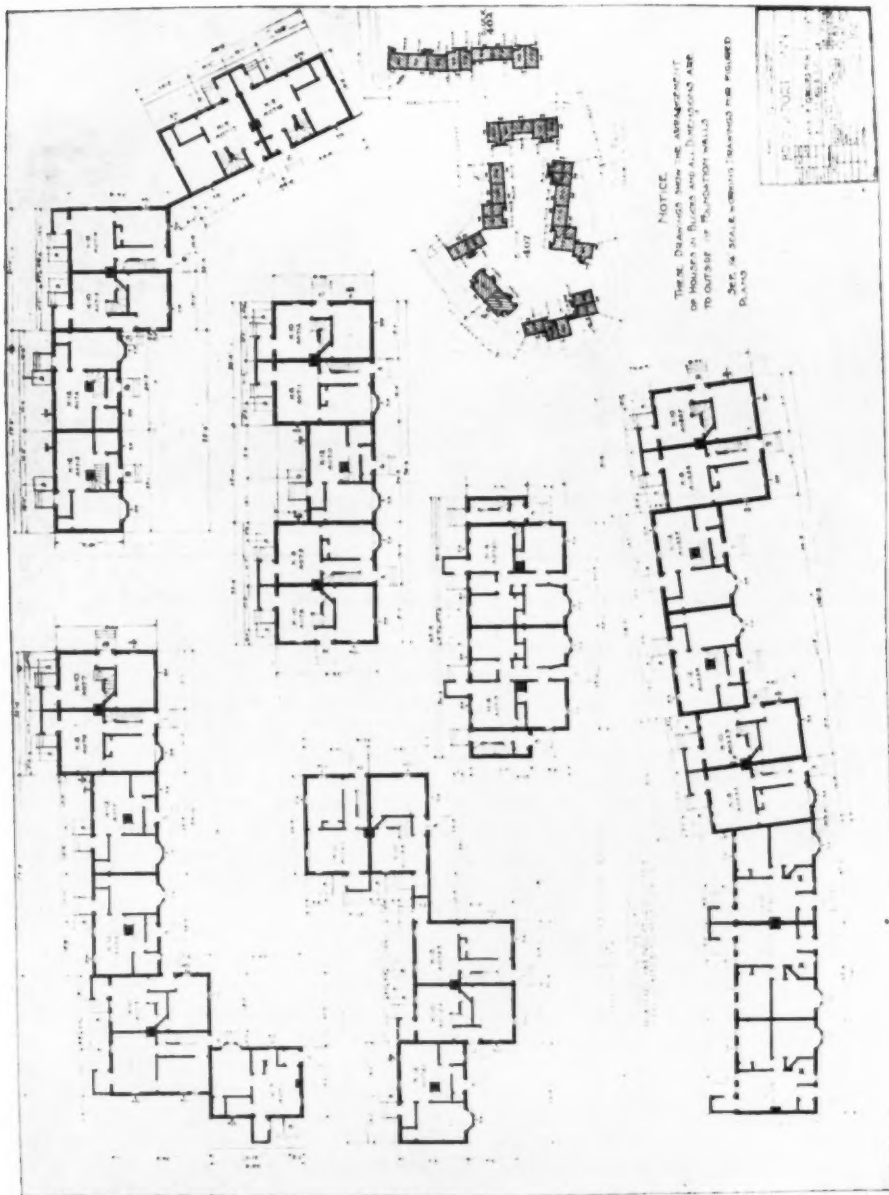
Messrs. Skinner & Walker of Bridgeport have been associated with Mr. Sturgis in the treatment of the Grassmere tract. The other three developments have been looked after in Mr. Sturgis's own office. It was on May 15, 1918, that the architect, together with the other two members of the committee in charge of the Bridgeport project, was appointed. The plans for the four tracts were speedily prepared; on July 31 the work was under contract.

V

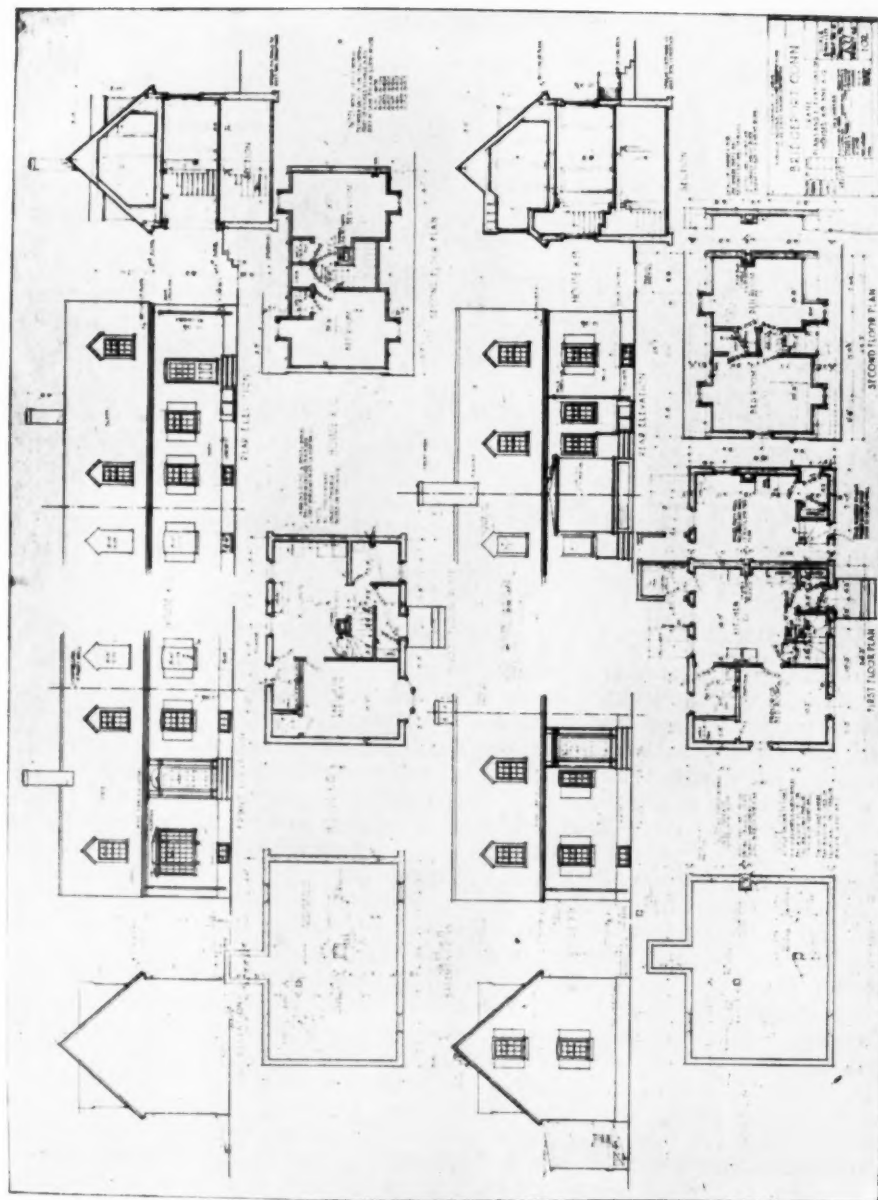
Besides the foregoing, there is a fifth development, undertaken later, and of particular interest as designed to meet the needs of quite a different class of

workers—a grade of low-skilled and correspondingly low-paid labor, employed in large numbers in a neighboring industry occupying one of many factories of the great metal-working concern of the R. T. Crane Company of Chicago, which are distributed among several large industrial centers of the United States. In the work on this "Crane development," as Group No. 4 of the Bridgeport project is called, Mr. A. Hepburn, of the Boston firm of Hepburn & Parker, is associated with Mr. Sturgis as architect.

In a scheme for model housing it is highly important that the class of workers, for whose accommodation it was specially intended, after all be not kept away by making it too good; that is, so attractive as to cause it to be occupied by a higher class of workers, able to pay higher rents. The danger has here been avoided by making the dwellings of a lower grade than would satisfy the higher classes of workers; at the same time they are decidedly better than anything the intended occupants have been accustomed to. So here we have another compact section of Bridgeport, planned for what is commonly regarded as a "tenement" population, but housed under



GROUND PLANS FOR BLOCKS OF DWELLINGS.
 CRANE DEVELOPMENT, BRIDGEPORT, CONN.



ELEVATIONS AND GROUND PLANS.
CRANE DEVELOPMENT, BRIDGEPORT



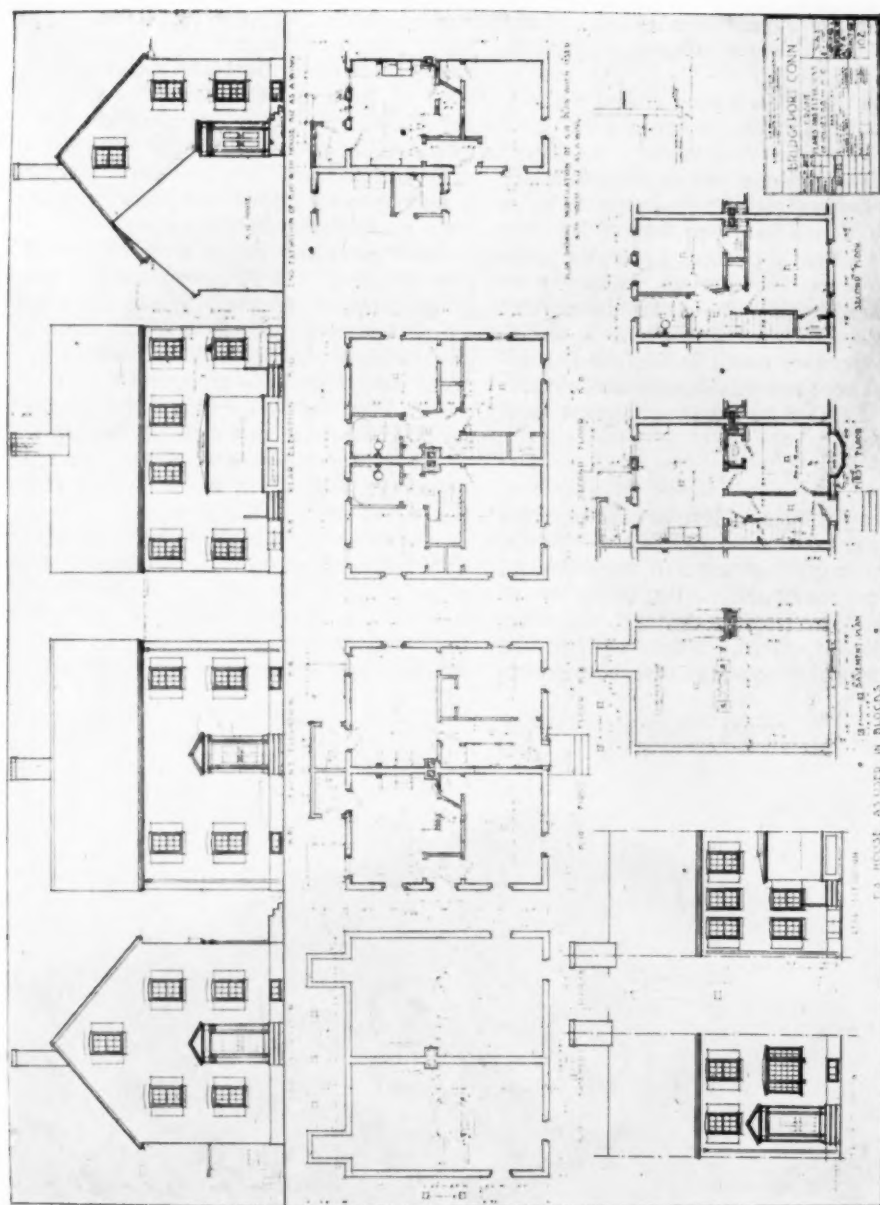
MODEL OF SEMI-DETACHED HOUSE. CRANE DEVELOPMENT, BRIDGEPORT.

conditions strongly in contrast to those of a typical tenement district. In the first place, we have here an outward aspect of the property so attractive that the people of Bridgeport will doubtless "point with pride" to it when they take their visitors over the city—in homely, unpretentious fashion it is not only agreeable to look at, but even beautiful. And being so, it seems morally certain that, by reason of cleanliness and simple charm, it will exert a commensurate influence upon the people who live there—counteracting the slovenly and vicious tendencies of the usual tenement environment and leading them along the first steps of the way to the higher grades of American working-life. People privileged to live here will hardly be likely to content themselves again with anything worse, but rather will learn to appreciate something better and seek to fit their children for higher grades of work. The occupants of these dwellings are for the greater part somewhat skilled workers in the lower and rougher grades of employment, such as are largely employed in the big factory near-by.

The site is a rectangular property of 22.176 acres, almost flat and so near the

sea-level that an embankment has been necessary to avert flooding at times of abnormally high tides. The plan well illustrates the possibilities and advantages of a non-rectangular development in economizing ground space and street construction and equipment with due regard to convenience of movement and the maximum benefit from sunlight and air, together with the housing of a population as large as such a tract can hold without congestion.

The houses are single dwellings, built in rows. Instead of monotonously stretching along the streets, the houses are designed in groups of units varying according to street layout and other conditions. Pains are taken to provide each family with ample back-yard space. The greater number of the dwellings are of one and a half story; but to meet the strong tendency in Bridgeport to live in flats, numerous two-story houses are provided for, as well as 14 four-family houses of three rooms each and 56 two-family houses of four rooms. One hundred and fifty-five single-family houses are of a two-story type. The plan provides for ultimate dwelling accommodations for 377 families, or about 12½



GROUND PLANS AND ELEVATIONS.
CRANE DEVELOPMENT, BRIDGEPORT.

families to the acre. This means a fairly dense, though by no means congested, population.

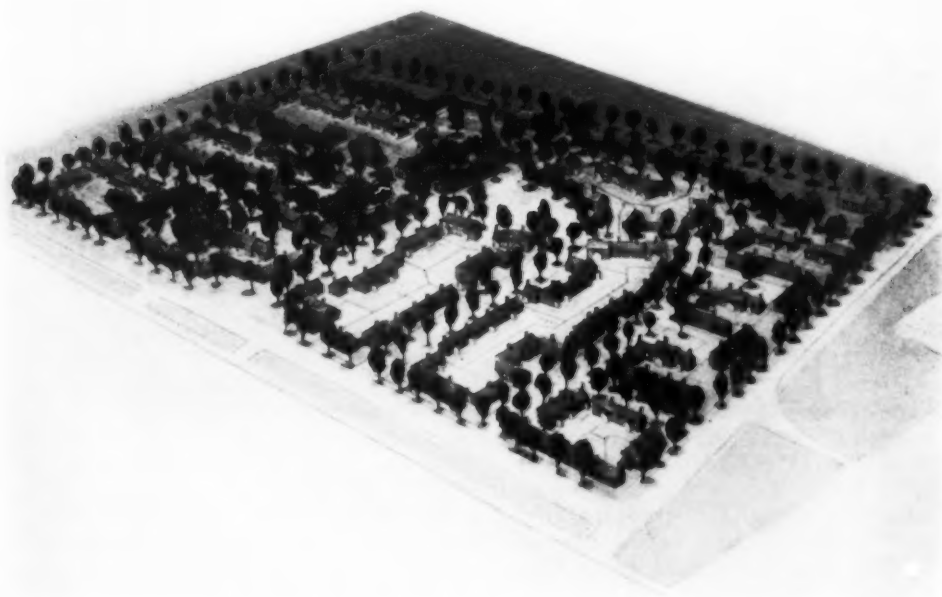
Higher grade workers would require living rooms and dining rooms; but here each dwelling has only a large combined kitchen and living room to accommodate all the indoor social requirements of a family. There is no provision for any special heating apparatus beyond a jacketed stove in the kitchen, sufficient to warm comfortably the entire house. But every house has a cellar where a single-register furnace could be installed if desired. There are gas ranges and electric lights. Each dwelling has a good bath room.

VI.

The controlling motive in planning and in the architectural treatment of this layout is to give, in terms of brick instead of frame construction, the effect of an old-time New England village, like Marblehead or Ipswich. The charm of the rambling streets and picturesque group-

ings in such a village derives itself largely from the sheds and other outbuildings casually built against the houses from time to time as utility may have called for them. So here a similar charm is obtained by composing the groups in varying sizes and heights—the units being irregularly joined and showing gable ends in varying relationships.

Neither is the irregularity in general plan at all arbitrary, merely for the sake of picturesque effects. While there are no abrupt declivities to call for them, as in Marblehead, this tract has many fine trees, and it was the recognition of their value that led to perhaps the greater number of these more suave departures from straightness—as in the varying depths of setback in house fronts from the street lines. A noteworthy instance is the way in which Forest Court is diverted from its normal direction to save a fine group of trees at the corner. While two of the border streets of the tract have houses facing them, a third, South avenue, has a character so disagreeable



MODEL OF A TYPICAL BLOCK OF DWELLINGS. CRANE DEVELOPMENT, BRIDGEPORT, CONN.

that it was wisely decided to have the dwellings on that side of the improved tract face away from it and toward Sims street, one of the highways within the property. Characteristic features of this development are the various deep forecourts with irregular house rows facing them and approached by service roads in the courts, which, together with unusual space for shade trees, shrubbery and grass, give playground room here and there for small children.

Noteworthy is the way in which the central cross street (Burnham street) is made to serve the traffic that comes to and from the heart of the city by two streets on the Iranistan avenue side. Almost halfway between these approaching streets Burnham street enters the property from the middle of a sort of atrium-like open space bordered by a conspicuous grouping of dwellings. In the long row of houses on the left of Burnham street, just beyond its intersection with the central longitudinal thor-

oughfare, Flanders street, a slight departure from a straight front in the long block of dwellings at the corner may be noted on the plan. Like similar instances in old New England spontaneous layouts, this departure may be hardly observable as such, but it has the value of enhancing the effect of the perspective. The motive for this departure is to give room for existing trees. Elsewhere a fine tree-group is preserved by planning the backyards to include them. Flanders street and its parallel, Alsace street, are gently curved to meet each other toward the northerly side of the property, merging in a street that makes a good common approach to the Crane works. At the backs of the houses wire fences, separating the adjacent back yards, give an open effect and tend to discourage untidiness on individual premises, while long hedge-rows of privet run at the backs of the lots. An attractive feature of the development is the little flatiron-shaped public green near the center of the property.

PROFILES AND MATERIALS

❑❑ *By William Luther Mowll* ❑❑

WHEN mouldings are made of white material they show in the highest degree the effects of contrast and gradation. Color and texture modify the effects of light upon their surfaces; and other physical properties, such as resistance to crushing and bending, to pulling apart and so on, limit their size and shapes.

A uniformly colored surface is less marked by contrasts and gradations than a white surface of the same shape. The darker the color the less visible is the form; consequently, when mouldings are executed in materials of dark color they must be larger and more vigorous in profile in order to produce appreciable effects. Similarly, to produce equal effects, forms placed in shaded positions must be larger and bolder than for well lighted positions. Parti-colored arrangements tend to exclude mouldings. The contrasts of the mouldings are lost in the contrasts of color. Both means of producing contrasts perform the same function of emphasis; and, used together, usually produce a redundancy or over emphasis.

Texture introduces other consideration. In many materials, the color is not flat and uniform as on a painted surface, but is marked by grain, or mottling, or other variations. These markings are usually of such a nature that it is on their account the material is chosen. In the woods used for finishing interiors, for instance, there is an extensive palette of colors and patterns of grain, from which the architect may choose tones and figures. These materials not only show their characteristic qualities to better advantage in plane surfaces, but it becomes more and more useless to mould their surfaces as the size and distinctness of the pattern or figuring becomes marked. The effect of a moulding is produced by its shape contrasts, which count as bands of varying degrees of breadth and definiteness. These bands are at times in-

terrupted deliberately; but, in such cases, the repeated forms, such as the heart and dart, are used at regular intervals, and the added details are of such shape as to enhance the intended effect of the surfaces upon which they are placed. The grain of wood or the figure of marble, however, falls upon the moulded surface irregularly, seriously disturbing its lines and clearness. Reciprocally, the different planes and curved surfaces of the moulding throw out the pattern of the material in which they are shaped. As wood or marble is chosen for the very quality thus disrespected, the omission of mouldings from such materials is seen to be a furtherance of the designer's purpose. The choice of a material involves the choice of its characteristic forms. The choice of a form excludes those materials to which it is not characteristic.

The physical properties so far discussed are of such a nature as to influence forms because of the appearance of the finished result. Hardness, density, toughness, and other kindred properties, however, have a direct part in the determination of the shapes and dimensions into which the materials which they characterize may be worked. The complexity of these relations involves some knowledge of the characteristic properties of each material.

The materials at the disposition of the modern architect are of two principal sorts: natural and manufactured. Stone and wood are used in the state in which they are found, except for changes in dimension and shape; the other materials used in building undergo some process of manufacture to render them suitable for use.

Of all the materials from which an architect may choose, stone has always been his preference. The more usual kinds are stones having the principal characteristics of granite, limestone and marble.

Granite presents the greatest difficul-

ties to the stone-cutter. It is split from the ledge by drilling rows of holes and by breaking off the slabs so outlined with the aid of compound steel wedges. At the stone yards the blocks are reduced toward the finished shape by breaking off pieces with the aid of heavy steel sledges and splitting hammers. Where slabs thinner than those quarried are desired, they are produced by a very gradual sawing process. Beyond the point where the block has been given roughly the shape desired, the successive steps consist in removing the surplus stone, bit by bit, by heavy blows delivered through stout tools from a heavy steel hammer. Although, in recent years, pneumatic tools have greatly reduced the labor of granite cutting, smooth finishes are only to be attained at the expense of long and severe labor. The granites are so hard that they take on an enduring polish, produced after several processes of finer and finer cutting, followed by long rubbing. The polish is much more easily applied to plane surfaces of considerable extent. The nature of these processes is such as to result naturally in forms bold, strong and vigorous.

Limestone and marble are both cut from the quarry by channelling machines, which plough like a large steam-driven wood plane with a narrow blade, cutting slots in the rock and so detaching blocks which are then sawed into slabs of desired dimensions much more rapidly than can be done with granite. A machine planer is used in the production of moulded surfaces both in limestone and marble, it being a very simple matter, once the slab of stone is bolted on the reciprocating bed of the machine, to plough out of its surface almost any required profile. Both marble and limestone balusters and columns are turned in lathes much more easily than granite.

In distinction to limestone, white marble is of much finer texture and is capable of taking a polish. Forms may be produced, in marble, of the utmost refinement and delicacy—to the limit of visibility, in fact, even at short range.

There is a gradation in these materials, from hardness and roughness and grayness at the one end to smoothness and

fineness and whiteness at the other. The granites vary sufficiently in character, so that the finer and softer grades approach limestone in their possibilities; and the coarse marbles sufficiently close the gap between the finer marbles and the limestones.

The three illustrations which follow are of buildings constructed respectively of granite, limestone, and marble. In each case the designer has used the material suitably.

The section through the cornice of the Broadway Institution for Savings, by York & Sawyer, shows bold, vigorous forms. The panels in the soffit merit attention. This order, according to Vignola, does not show any such soffit panels. The material is dark, and the position of the panels is such that they are not well lighted. They have, consequently, been made deep, and without the small mouldings usual to such features.

Compare this with the marble cornice of the Knickerbocker Trust Building, at Fifth Avenue and Thirty-fourth Street. Here the whiteness and facility of the material has permitted the introduction of a very delicate treatment in a similar position. The Broadway Institution for Savings is in every line of its treatment broad, severe, simple, large in scale, admirably studied in harmony with the material. The Knickerbocker Trust Building is in marble, because the means at the disposal of the architect were such as to permit a great deal of carving. The marble was chosen because it could be carved in these forms; and, being chosen, the scale is relatively delicate and the surfaces moulded and enriched.

The detail of the Gorham Building is intermediate in scale, because its material, limestone, is intermediate in color and in freedom under the chisel. The comparison is not theoretically perfect, because the Knickerbocker Trust is Roman in the fullness of the profiles and in the opulence of its carving, while the scale of the material in the Gorham Building is a little forced toward fineness by the studied reflection of Florentine delicacy in its outlines.

Above the bed mouldings, the cornice of the Gorham Building is of copper.

Except for this difference, the arrangements are similar. The cornice block of granite is 1 foot $5\frac{1}{4}$ inches high and that of marble 1 foot $6\frac{1}{4}$ inches. There are five divisions in the former and seven in the latter; that is, there is one division for each 3.45 inches of height in the granite cornice, and one for each 2.61 inches of the marble cornice. The next section, from the underside of the cornice to the bottom of the bed mouldings, is 1 foot $9\frac{1}{2}$ inches in the granite cornice, and 1 foot $11\frac{1}{2}$ inches in the marble cornice; there is a division for each 3.58 inches in the granite and one for each 3.35 inches in that of marble. The architraves are respectively 2 feet 1 inch and 2 feet 11 inches in height; there is one division for each 4.28 inches in the granite and one for each 3.5 inches in the marble. Following the same method of comparison, it appears that the bed mouldings of the limestone cornice, which are 2 feet $1\frac{1}{2}$ inches in total height, are so divided that there is one division for each 3.64 inches of height; and that in the architrave, which is 2 feet 3 inches in height, there is one division for each 3 inches of height.

These materials are not separated by limits of scale beyond which it is impossible to pass. Each has a considerable range. In one particular only is there such a boundary, and that is in the smallest possible member. This involves not only the nature of the material but also the skill of the workman in cutting the material without breaking it. In these cases the smallest fillets are respectively one-half inch for the granite, one-quarter inch for the marble and three-eighths inch for the limestone.

The other differences are to a certain extent indicative of other design considerations besides those involving the material itself.

The character of the carving should be compared. The elaborate frieze of the marble building would be much less effective in limestone if it were possible at the same scale. The wide egg and dart moulding of the limestone building has contrast enough so that it counts clearly in the darker material, and differs from that in the marble building in

that the dart is not cut away from the cup of the egg. This leaves the dart and the cup forming a mass which can be cut with less danger of breakage than if the parts were separated as in the marble design.

If the profiles of the bed mouldings or of the cornice of the Institution for Savings are compared with a text book order, it will be seen that the members are less numerous here. The modillion is rectangular, not only because this form harmonizes with the other forms of the façade, but also because no more detailed form would be suitable to the material. The crown mould of the cornice itself is $9\frac{1}{4}$ inches high, giving space enough for each of the few parts at the large scale necessary.

A comparison of this baluster with that of the Knickerbocker Trust Building emphasizes the difference in scale. There are nine divisions in height in the Institution for Savings and twenty-three in that of the Knickerbocker Trust. In the cap of the Institution for Savings, in a height of $8\frac{1}{2}$ inches, there are only two members; in the cap of the other, in a height of 1 foot 1 inch, there are six divisions, and really more, as the little soffit with its drip count as additional members in any view of the building.

This comparison of three of the many materials at the architect's disposal shows in only the most general way the effects upon design of the particular material in use. An extension of such comparisons on the part of the student of architecture is a fundamental step in appreciation.

It must be pointed out, by way of caution, that in recent buildings architects have many times gone beyond the limits which would be naturally chosen by a workman familiar with material in use. Present conditions separate the architect too far from the material in which he works. The best examples, therefore, for such study are those in which it is certainly known that the craftsman has had the proper chance to have his judgment heard.

There follows a general review of other materials used in building. Wood is the material the use of which is most familiar. The development of design in

this material has followed two main courses. Wood has been given forms like those of stone, with variations in scale due to its own properties. It can be cut into forms as fine as those of marble; in this case it is usually painted. Light tones on the surface develop the visibility of its forms. Except for its ability to resist stresses better than plaster, it has in this case no advantage over that material, which has replaced it in many uses to which painted wood was formerly put. On the other hand, wood is used on account of its natural beauty. Its variety of patterns rivals marble, and it suggests a warmth and an intimacy impossible to that material. Just as is the case with marble, the grain of unpainted wood prohibits the use of fine profiles; wood is best used in plane surfaces, with few and simple flat mouldings in scale somewhat larger than marble.

The materials which must be compounded as well as shaped are concrete, plaster, burnt clay, steel and iron, and other metals, chiefly brass and bronze, and glass. The processes by which these materials are made ready for use fall into curiously few categories. All of the substances which are used in mass form, as distinguished from rolled sheets or bars, are moulded, including plaster, concrete, and all building materials made of clay, iron, and bronze. Concrete and plaster are moulded cold and harden chemically; the metals are melted and poured. The shapes which they each take have as limiting factors the properties of the particular material in its finished condition.

Plaster is capable of being cast or run into the finest of forms. The first step in the production of any modelled form is the making of a model in clay. From this a mould is made, usually in an elastic material. The elastic material is held in position by an enclosing removable box. The flexibility of the mould permits any desired effects of relief or undercutting, and it can be sprung off from the hardened plaster without damaging the latter. The resultant forms of the plaster cast in the mould are capable of finish by painting, bronzing and so on.

Their use is strictly limited by the fragility of the material. Plaster work is so easily liable to damage that it must be entirely excluded from locations where the surfaces are exposed to contact. Plaster properly used is a worthy material, the substance of many beautiful architectural details; and while it is the least enduring, it is the least expensive material in which beautiful forms may be produced.

Concrete may, in many respects, be worked like plaster. It is cast into all architectural forms, from piers and walls to statuary. It is chosen for the structure of a building because of its hardness and rigidity, and in preference to stone because it costs less. No method yet perfected, however, has produced walls cast in forms built at the building which can be finished in such a manner as to present a pleasing appearance. In order to keep the cost down it is necessary to use inexpensive labor and relatively rough methods. It has been used with success in engineering works in broad surfaces which are so situated as to be always remote from the eye, so that the irregularities are lost in the general effect.

This material is also made into blocks to be used in place of stone. The crushed stone and cement of the material are poured together into moulds forming blocks, the surfaces of which are afterward dressed in the same manner as natural stone, presenting a surface not unlike a brecciated marble. In this use, and with a marble aggregate, the surface is sometimes polished. As a building material it may be made quite equal to natural stone in hardness and endurance.

In the production of mouldings and other forms of detail concrete is limited only by the sand process of moulding, which does not permit of re-entrant mouldings. To take the place of carving, a very fine concrete is used, which is cast in elastic moulds, such as are used for plaster. The relative expensiveness of this latter process places it out of the rank of possibility commercially, except for forms many times repeated.

In scale, mouldings in concrete will usually be not finer than in limestone.

Although the material is very hard when thoroughly set, it is usually necessary to handle the blocks when green, in which condition they are more liable to damage than is stone. This makes it necessary, in designing, to avoid edges too sharp and too isolated. For fine buildings the choice will naturally be of some material which will provide the beholder with more satisfaction in texture and color.

Terra cotta differs from the preceding materials, because it must be baked at a very high temperature. The original model is, as before, made in clay and cast in plaster. The clay block is then pressed into a reverse mould of plaster and dried. Up to this point all the refinements possible to plaster may be introduced. In the process of baking, the tremendous and sustained temperature would actually melt thin projections. Further, as the blocks are made of a clay, which is not pleasing either in color or texture, the finished surface is produced by spraying the block, before the baking process, with a "slip" of creamy consistency which, besides providing the color and texture, has a tendency to diminish the sharpness of all angles, especially the interior angles, and will completely fill all small interstices. It is impossible to prevent a considerable amount of shrinkage and distortion in the blocks. On this account, the design must be of such a character that a certain amount of irregularity in line does not seriously affect it. An allowance must be made for joints somewhat larger than those possible in stonework. Because of these factors the general scale cannot with success be made finer than with limestone.

Undercutting and a free use of ornamentation are easily attained by the moulding processes. The blocks must be small compared with stone, because the distortion in baking is less in small blocks. As terra cotta is always anchored to or supported by steel, the projections of members are not limited. The surface may be any color within the range of chemical possibilities, which excepts only certain reds that no manufacturer has yet seemed able to obtain.

This is one of the few materials of

permanent character in which the architect may use color out of doors, with, at the same time, control of the texture. In the novelty of this experience, color and form have been used simultaneously. Whole sets of forms, designed as pure forms, have been picked out in a variety of colors. Each applied color varies the effect of the surface to which it is applied to a greater extent as the color is darker. Profiles of a group which are harmonious before the application of color are thrown out of relation by its presence. The effect of form is diminished by the presence of a single tone. It is destroyed by the presence of a variety of color. The success of moulding forms is dependent upon uniform color. It would seem to be true that terra cotta is best used either in uniform color and modelled or in relatively flat surfaces with variety of color.

The metals also are cast in moulds. Iron is cast in sand. The limits of this material are due to its granular texture; and its brittleness limits the length of unsupported members in proportion to their thickness, so that its parts must be thicker than wrought iron or bronze. Its color is not a factor, as it must be protected by paint to prevent oxidation.

Bronze, which is also moulded, is superior to cast iron in smoothness of texture. It presents a surface which weathers in such a manner as to become one of the most beautiful available. It is superior to iron in rigidity, so that the keenest, sharpest, and deepest of moulding forms may be executed in it in permanent forms and at the finest of scales.

This leaves to be considered the wrought metals. Iron, of chemical composition different from that used for casting, is rolled hot into bars of various sizes. These bars are reheated and forged into the familiar forms of this material. The profile forms are limited to such as may be produced under the hammer during the malleable period. They are naturally simple in form. The scale is about that which can be attained in cast iron. Wrought iron work is essentially a craft; and the designer is strictly limited by the capacity of relatively few workmen, as well as by the

resistance of the material. The triumphs of this branch of workmanship in the production of elaborate scrolls and leafage have been attained only by very special skill and are only reproducible by a rare workman, whose ability fixes the limits of the design. It may be said that limitations of this same character are only less binding in every branch of architectural design. No building can exist by and through the efforts of the architect alone. The workmen must carry out the design; their place is not sufficiently acknowledged and, in many of the building trades, they are not sufficiently occupied.

The sheet metals, copper and iron, are worked cold. Profile forms are produced in machines by bending the sheets, in which case the mouldings are hollow and

are supported by brackets of some rigid material; or they are drawn on to wooden cores. Copper, on account of its superior ductility, may be used to produce finer forms than iron, perhaps down to the scale of cast iron, although the dark color of the surface usually dictates a choice of bolder outline. Iron is incapable of sharp bending without breaking and is limited to not less than the scale of limestone and this only with much rounding of the angles.

To sum up, the forms of mouldings are, first, motived by design and direct a choice of material. They are then subject to the restrictions of the particular material in which they are to be executed. When these restrictions have been accepted they have always served to develop a beauty due to fitness.

MODERN INDUSTRIAL PLANTS



By George C. Nimmons

Part IV.

DISCUSSION OF THE VARIOUS TYPES OF WINDOWS
FOR INDUSTRIAL BUILDINGS.

THE subject of the various types of windows is one of particular interest at this time, because of the improvements that have been made in natural lighting by the general use of the different windows so extensively advertised and sold on the market.

An outstanding feature nowadays in industrial buildings is metal sash in large quantities. The various kinds of sash have much merit and have accomplished much in improving the natural lighting of buildings, but many of them have two defects which are well worth eliminating, as they are so serious in many cases as to cut down their efficiency materially. Metal sash windows are usually divided up into many small panes of glass, which are the greatest dust and dirt catchers imaginable, the many small divisions making it almost impossible to clean them. The second defect often encountered is an entire lack of means by which such windows can be opened so as to get at the outside of them for cleaning.

Often such metal sash windows are placed high up in the air in positions where they are absolutely inaccessible except by a painters' scaffold.

The amount of radiation and piping necessary to heat a building is proportioned to the amount of cooling surface of the glass in the windows. Every foot of glass in the windows means the consumption of so much coal in the boilers. Large windows make the coal bill high; but this, as a rule, is a good investment, provided the windows are kept clean and made to produce a fair return of good light in exchange for the extra coal which is being consumed on their account.

The original reason for small panes of

glass was the economy in first cost and in renewal of breakages, but now that the economical methods of producing sheet glass have reduced the cost of the large lights, the reason for small lights no longer applies, especially as the very considerable cost of all the small metal sash bars must also be taken into account.

If, then, in selecting steel sash, a type of window is chosen which lights the building reasonably well and has glass of proper size with as few horizontal bars as possible and with adequate means of getting to the outside of them for cleaning, then the enduring lighting efficiency of such windows will be greatly improved. The essential for designing sash so as to be easily cleaned is to make the lights of glass sufficiently long so that a man with a window cleaner can cover as long a space as possible with one downward sweep of his arm without encountering cross bars that intercept the operation. The width of the light of glass does not make so much difference as its length, so long as the width is sufficient for the ordinary window cleaning device to pass between the vertical bars.

The former requirements of the fire insurance underwriters are responsible for some of the small divisions of sash and the difficulty of getting to the outside of them, but now these rules have been changed so that for walls exposed to fire hazards suitable improvements can be made in conformity with the new regulations.

In situations where the work must be screened from the sunlight, windows should be chosen of a type which will permit of the operation of shades.

Metal windows are made with sash



PLANT FOR THE COLTS PATENT FIRE ARMS COMPANY, HARTFORD, CONN.

Aberthaw Construction Company, Boston, Builders.

This represents a type of skeleton reinforced concrete construction erected by many industries engaged in the manufacture of war products.

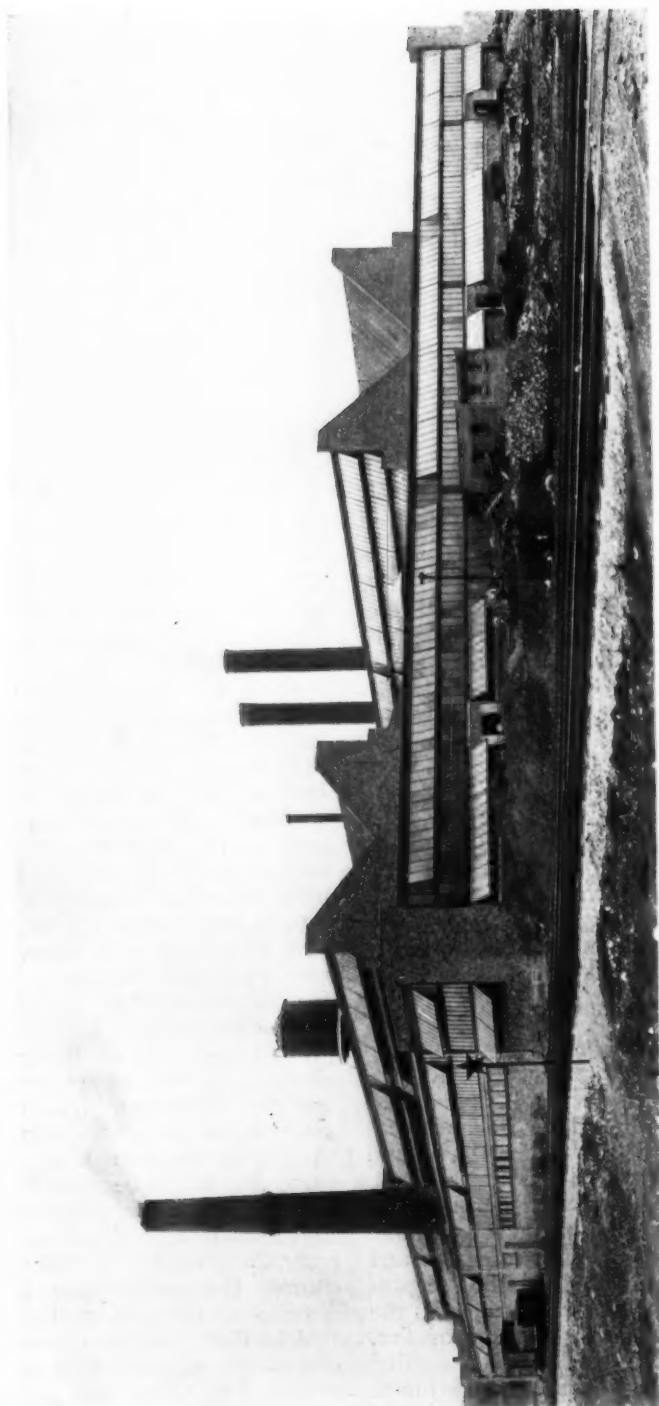
which pivot, hinge or slide. Many makes have been tested and approved by the underwriters and there is a kind of window to be had for almost every purpose. Some of them are most skillfully and accurately made, and operate in their various parts like a piece of fine machinery.

If metal windows are not to be used, there is no objection to the old wooden frames and sash, provided they are strongly made, free from cracks around the frames, and designed, as they should be, so as to be durable, easy of operation, and readily cleaned.

STAIRWAYS, ELEVATORS, SPIRAL CHUTES AND CONVEYORS.

The location of stairways, elevators, spiral chutes, and conveyors must first depend on the convenience of employees and operators, the travel of material, and the routing of production in a plant. City ordinances usually determine the number and location of stairways. One of the first objectives in the design and location of stairways should be the provision of a safe and direct exit from the building for employees in case of fire. In 1917 the loss of life by fire totaled 1,332 persons, and 5,280 were injured. City building ordinances frequently do

not require a form of construction that is adequate and safe. A stairway should always be shut off from the rest of the building by a fireproof door and walls, and there should be enough stairways of sufficient width so that everybody can safely escape in case of fire, whether the building ordinances of the locality require such provision or not. It is usually required that stairways be placed on outside walls, and as a rule the space next to a fire wall occupied by a stairway causes less obstruction to the operation of a plant than any other, and a stairway so located will serve equally well for two divisions of the building. Elevators should also be inclosed in fireproof walls. The location of the several elevators should never be scattered in any one department if it is possible to avoid it, as the passageways necessary to lead up to them occupy unnecessary space that might be used for production if the elevators were grouped together. Elevators in each department should be centrally grouped if possible, so as to shorten the passageways for a central distribution of goods and materials carried by them, and also in order to allow everyone who uses them the immediate choice of using any one of two or more at the same spot, thus precluding the



MOLINE MALLEABLE IRON COMPANY'S
BUILDING, ST. CHARLES, ILLINOIS,
FRANK D. CHASE, INDUSTRIAL ENGINEER.

necessity of traveling about from one place to another to find a car that is disengaged. It is seldom, if ever, the best plan to place elevators out in the middle of a room, because they thus interfere with the layout and expansion of the production of the plant. What is meant by "centrally" locating them is the placing of them up against the center of a fire wall or some such necessary construction that will make a fitting background for the activities that take place around elevators.

The location of spiral chutes and vertical conveyors should also be worked out upon the same principles. Spiral chutes, however, must always be set out from walls far enough to render accessible the different openings which occur around their circumference in the different stories.

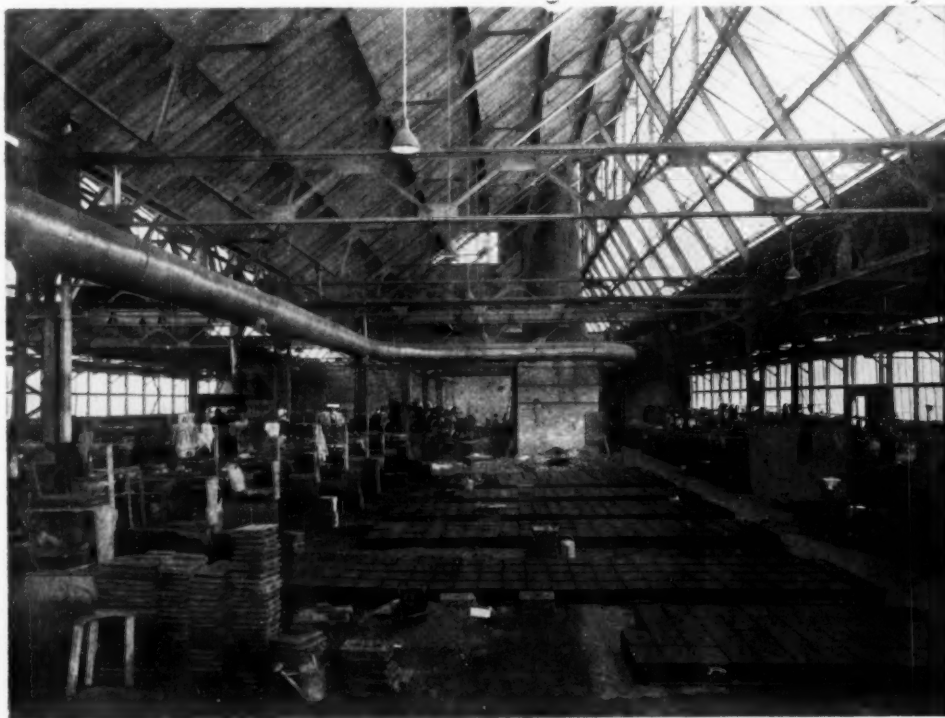
WEARING SURFACES OF FLOORS.

The principal materials used for the

wearing surfaces of finished floors in industrial plants are cement, wood flooring, wooden blocks, asphalt compositions, sanitary floors, tile, brick, and steel plates.

The increase in the carrying capacity of freight elevators from four to six thousand pounds or more has brought about the use of large trucks carrying heavy loads that soon crush the tongues and grooves of $\frac{7}{8}$ " maple floors and wear great holes in the kind of cement finish formerly put on concrete floors, especially if the trucks are not provided with rubber tires and are such that the wheels must be small. Floors made of the different compositions of asphalt have been found to soften up in many cases where the temperature went up too high, while wooden blocks, as they were at first made, swelled and shrunk until they frequently got out of level.

The question of a satisfactorily wearing floor has been a most perplexing one



MOLINE MALLEABLE IRON COMPANY, ST. CHARLES, ILLINOIS.

The center of this 150-foot wide foundry is as light and clean as the space adjacent to the outside walls. Frank D. Chase, Industrial Engineer.

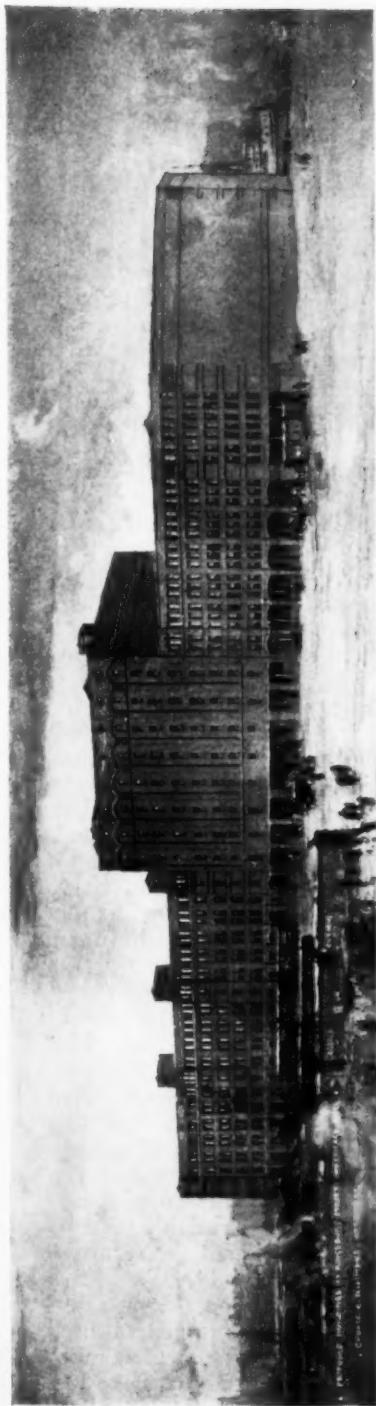
REID
MURDOCH
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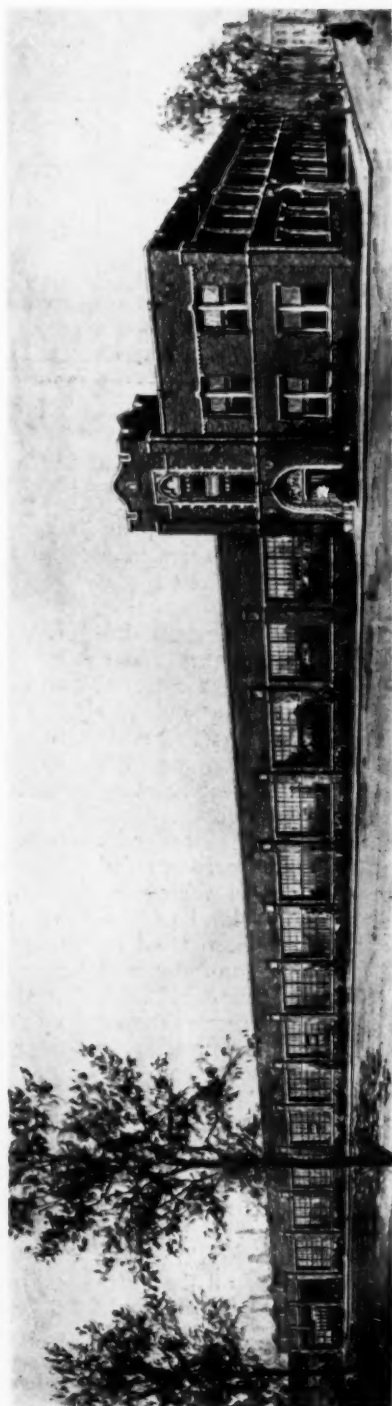
WHOLESALE GROCERY PLANT OF REID, MURDOCH AND COMPANY OF CHICAGO, ILLINOIS.

George C. Nimmons, Architect.

Along the Chicago River it has long been the custom to neglect the design of that part of buildings fronting on the river, which was regarded as only suitable for the back doors and the least attractive elevations of such structures. The above illustration represents an effort to make the river attractive and to improve this waterway by making the elevations of the buildings fronting upon it, interesting and dignified. The wharf just above the water line is of solid concrete where goods are handled from boats, and the projecting balcony above is a sidewalk intended for foot passengers who may pass up and down the river at this level without being obstructed by the handling of material from boats on the dock below.

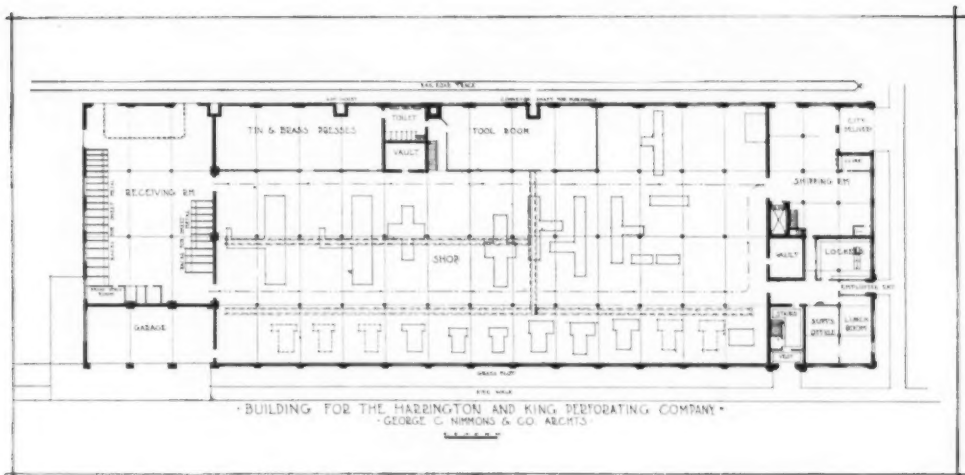


RAILWAY TERMINAL WAREHOUSE AND COLD STORAGE PLANT, CHICAGO, ILL.
George C. Nimmons, Architect.



HARRINGTON AND KING PERFORATING COMPANY'S PLANT, CHICAGO, ILLINOIS.
George C. Nimmons and Company, Architects.

The erection of this building was interrupted by the war, but it is expected soon to be resumed. It is for the manufacture of metal screens for screening all sorts of food products and other industrial materials. Metal screens are made here in brass, with holes smaller than the eye of a needle for screening food products and with thick steel with holes 2 inches or more in diameter for boiler ends and for screening various industrial products. The raw material for the manufacture of the screens is received at the left side of the building, where it is hoisted on a trolley. Material will be stored in compartments in the receiving room, where it will also be cut up into required sizes and worked directly through the plant to the right as indicated. Provision is to be made for automatically catching the metal from the punchings and conveying it by carriers to the room made to receive it. The finished products are shipped away from the shipping room at the right of the building by rail or truck. Offices are to be provided in the two-story portion of the building at the right and provision made for the welfare of the employees. The low tower in the elevation is to enclose the main stairway extending up to the roof.



in many cases. All sorts of expedients have been tried and many of them have not been successful. In those cases where extremely heavy loads must be carried on trucks, the last resort has often been the laying of steel plates. Steel is, of course, the hardest material available for such a purpose and will stand the punishment all right, but not without efforts to buckle up, and not without making a deafening noise every time a heavy truck passes over it.

These discouraging experiences with floors, however, have been accompanied by certain improvements in their construction. Probably every kind of material at all adaptable has been tried on floors, with the result that nothing new seems to have brought about as much improvement as some of the improved methods of using the old materials.

In cases where hardwood floors are most appropriate their durability and strength can be increased in three ways.

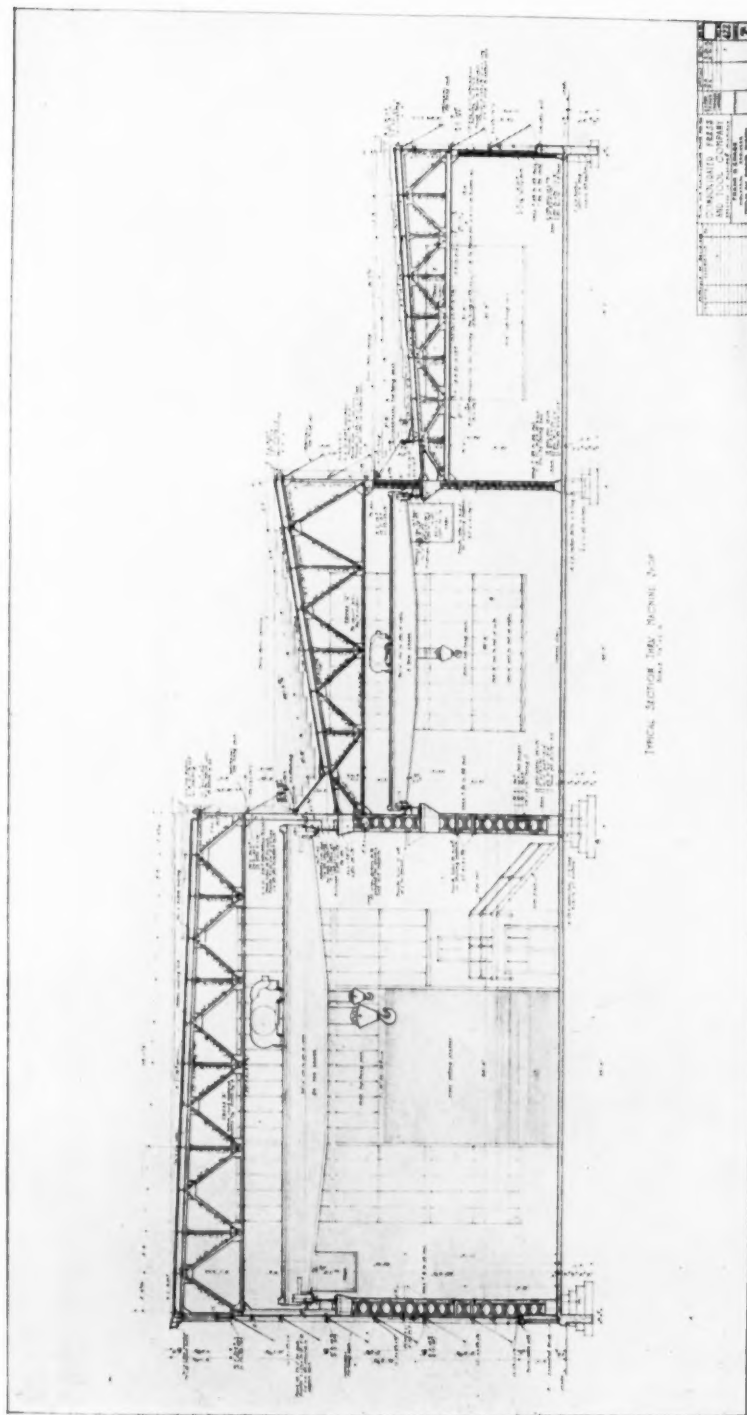
Firstly, one may use flooring one and one-eighth inches thick instead of seven-eighths or thirteen-sixteenths. The extra thickness does not cost much more comparatively and the strength of the floor is at least doubled, as all the extra thickness of wood in this case comes above the groove.

Secondly, it is well to lay down a lining of inexpensive dressed lumber on top of the floor strips in a fireproof building—

or directly on the plank floor of a mill building—as a level bed on which to nail the finish floor. This in a large measure prevents deflection and saves the tongues of the finished flooring from splitting under the weight of heavy trucks.

Thirdly, the strongest board floor of this type that can be made is secured by first laying a lining of inexpensive dressed boards, and on this a maple flooring composed of narrow pieces that have square edges and no tongues and grooves, nailing them well in place right down through the top of the piece. Such a floor will not be quite as smooth as the tongue and groove floor, but will wear much longer.

Many an owner has been disappointed by the unexpected softness of the cement floor finish of a concrete building. His idea usually of the hardness of that finish is the dense and shiny hardness characteristic of a country sidewalk or the basement of a house. The conditions for laying a cement floor finish in a concrete building are very different from these. In fact it is but very recently that a method has been discovered for securing the hardness of country sidewalk in the floor of a concrete building. Soon after concrete buildings came into general use, there were a great many patented mixtures placed on the market to make cement floors hard. These could not in any



CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.
 Cross section through the machine shop showing arrangement of top hung
 sash whereby the center bay is as well lighted as those on the outside.
 Frank D. Chase, Industrial Engineer.



CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.

Frank D. Chase, Industrial Engineer.

One of the striking features of this machine shop is a solid glass front window, measuring 36x260 feet, framed in white enameled brick. Note that the size of the panes of glass are such that they can readily be cleaned.

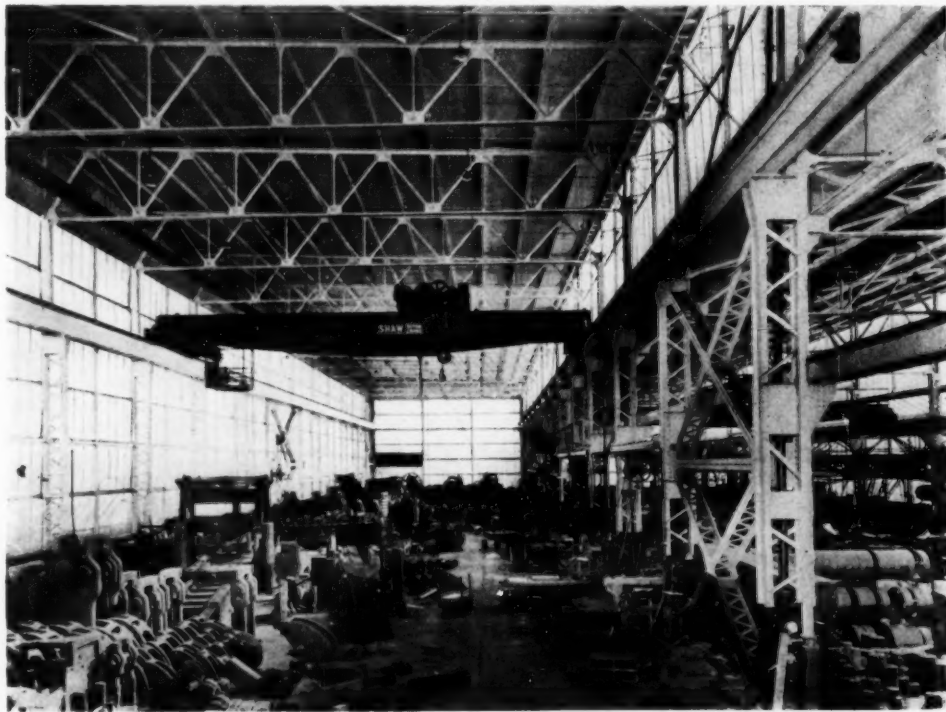
case make the floor hard unless the cement finish was mixed and put on according to a method which at first was not at all well understood by builders. Some of these mixtures do add materially to the hardness of the floor, provided the cement finish is made properly. The principal trouble with the finish in old concrete buildings was that it was put on too wet and worked with trowels and screeds until the soft particles—which bob up like corks in water—all came to the top, interfering with the crystallization of the cement and producing a substance sometimes as soft as chalk. In the country sidewalk the cinders or broken stone on which it was laid allowed the water to soak away below, but in the concrete building the floor slab on which the finished floor is laid prevented this draining action.

The method that has recently proved so successful does not involve putting a thick layer of wet mortar on top of the

slab at all, but instead consists in transforming the top of the structural slab itself into the cement finish, where just as thin a layer of mortar is used as will level up the uneven places and where perfectly dry cement is applied to enrich and harden the finish as it is worked into shape. All surplus water is immediately disposed of and a covering of wet sawdust and sand is provided to protect the work against damage from rain storms and to allow the construction of the building to proceed without undue delay.

If, therefore, cement floors which are as hard as a good country sidewalk will also be hard enough to withstand the uses to which the building is to be put, then the above dry method of unit construction should be followed. If desired, the addition of one of the good floor hardeners will make it still better.

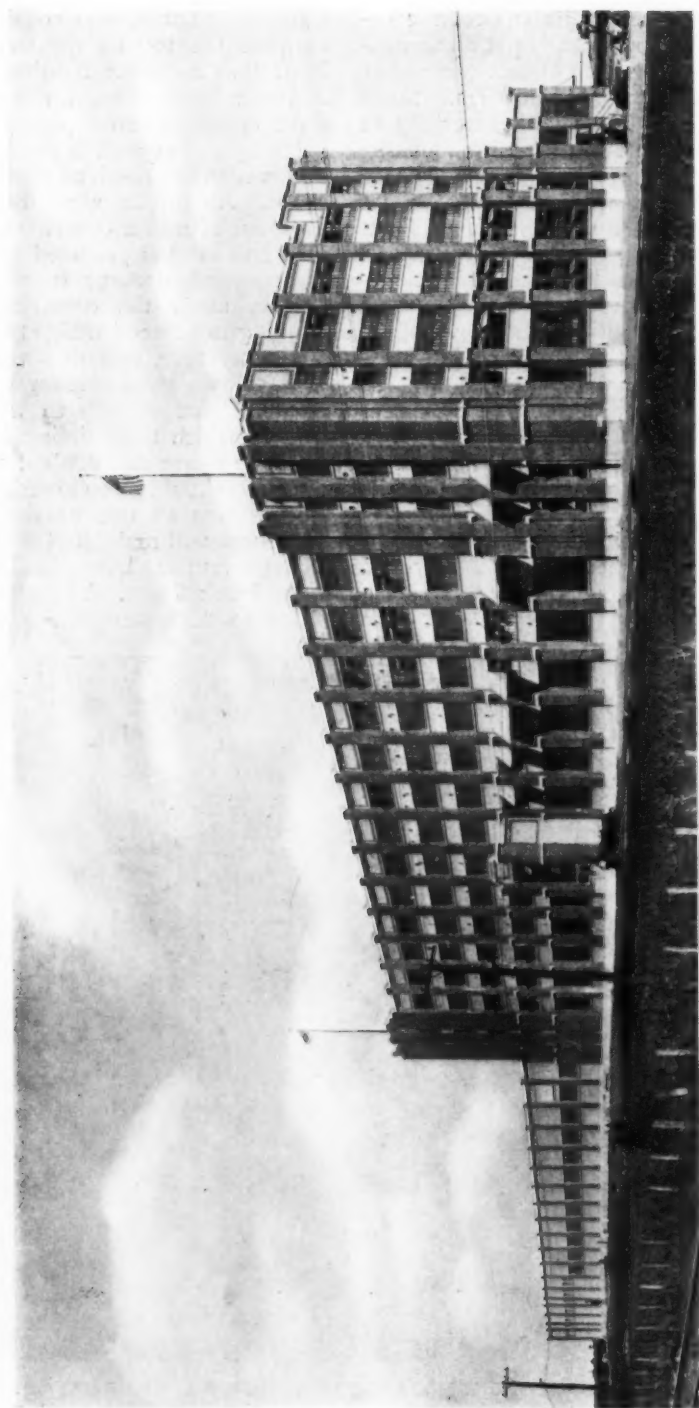
Improvements have also been made in wood block floors. The material seems today to be better and more seasoned



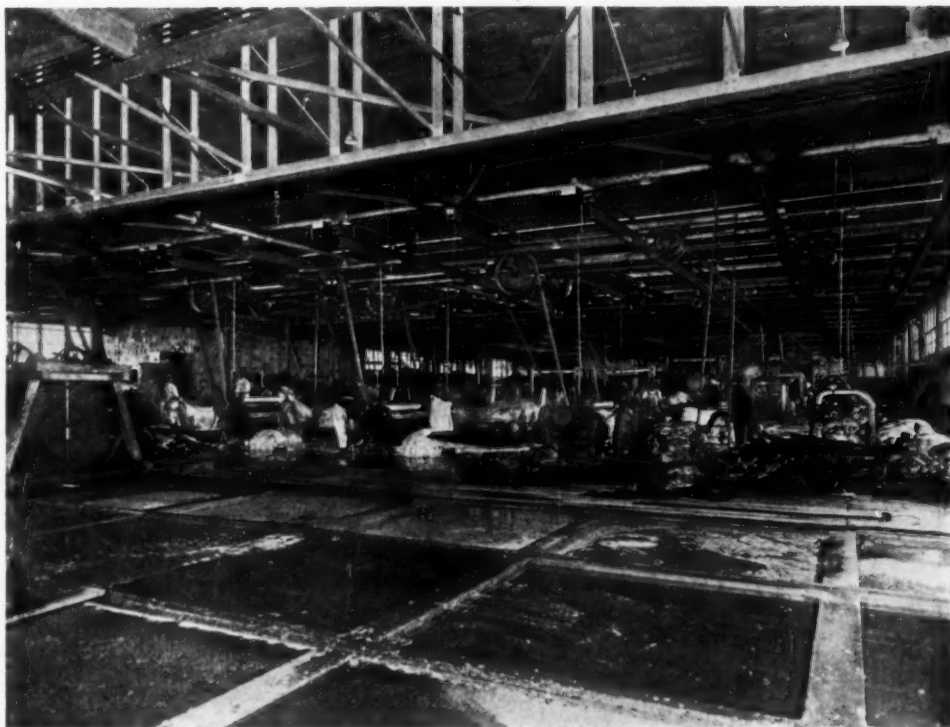
CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.

Interior of the main bay of the machine shop, showing abundant lighting from all sides.

Frank D. Chase, Industrial Engineer.



WILDER TANNING COMPANY, WAUKEGAN, ILLINOIS
Frank D. Chase, Industrial Engineer.



WILDER TANNING COMPANY, WAUKEGAN, ILLINOIS.
Interior of saw-tooth vat house, showing monorails for handling skins.

Frank D. Chase, Industrial Engineer.

than it has been in the past, and there are several varieties to be had which have the pieces doweled and grooved in such a way as to hold them securely in place and prevent the top surface from getting out of level.

Brick and tile floors may be used with good effect where chemicals would destroy other materials, and there is nothing better at a moderate cost for the floors of toilet rooms, lavatories and other places where a non-absorbent floor is required, than plastic composition floors.

CONVEYORS AND MECHANICAL HANDLING OF GOODS.

While heavily loaded trucks have increased the difficulty of maintaining the wearing surfaces of floors in good condition, the invention of conveyors and equipment for the mechanical handling of the materials of production has made

it possible to eliminate much of this trucking and reduce at the same time the number of employees so engaged.

As it is intended to incorporate in a forthcoming article of this series a description of the workings of the plant of Sears, Roebuck & Company, where there is undoubtedly the largest variety and number of mechanical conveyors to be found anywhere in a single plant, further discussion of the subject will be deferred.

FIRE PREVENTION AND SAFEGUARDING OF EMPLOYEES.

Fire prevention is a subject that should have a strong appeal to the people of this country, because the United States is—with the exception of Canada—the worst offender in the world. The annual loss by fire in this country has reached the enormous sum of approximately two



BUILDING FOR THE RICHMAN BROTHERS COMPANY, CLEVELAND, OHIO. A STRUCTURE DEVOTED TO THE MANUFACTURE OF CLOTHING.
The Christian, Schwarzenberg and Gaede Company, Engineers.



THE TELLING-BELLE VERNON BUILDING, CLEVELAND. FOR THE MANUFACTURE OF MILK PRODUCTS.
The Christian, Schwarzenberg and Gaede Company, Engineers.



BUILDING FOR THE L. N. GROSS COMPANY, CLEVELAND, OHIO.
The Christian, Schwarzenberg and Gaede Company, Engineers.
A shirt waist manufacturing plant.

hundred and fifty million dollars. *The average annual loss per capita in Canada is \$2.96; in the United States, \$2.26; England, 64c; France, 74c; Austria, 32c; Germany, 28c, and even in Russia, where they have long winters and lack our improvements and development of fire apparatus, it is only 97c.

This loss of course is paid for by everyone who carries a dollar's worth of fire insurance. The fire-trap buildings are responsible for it, and every owner who adds a new one to the list not only subjects himself to the risk of the complete destruction of his plant and serious interruption to his business, but at the same time causes everyone who carries fire insurance to pay for that loss in the form of high insurance rates in case it burns down.

The fire prevention laws in this country fail to prevent fires to any reasonable extent, otherwise America would not be next to the head of the list of those nations which permit the greatest waste and destruction of their own building resources in this way.

*Amounts taken from the Report of the Conservation Commission of Canada, which has recently been issued.

Canada, the worst offender, is just now wakening to a realization of her failure in this matter, and has recently issued a most valuable report on the subject, indicating the reforms to be acted upon in that country. The heavy annual loss suggests that it would pay this country well to investigate and to control the situation by proper legislation. Such a burden upon the industries materially increases the cost of production, as the expense of maintaining adequate fire insurance in this country is four or five times greater than it is in Europe.

In the meantime, if every owner who builds would only voluntarily do what he could to prevent the spread of fire, he would not only secure lower insurance rates, but would help greatly to reduce the annual loss. If one cannot construct a building to be absolutely fireproof there are still many preventive measures that are well worth the taking.

Fire walls, incombustible walls to inclose stairways, elevators, chutes, and courts are a fine investment. If every opening that will allow fire to travel uninterruptedly from one department

to another is cut off by something that will resist or even retard the fire, a building can often be saved from complete destruction. There are many varieties of fire-resisting windows, doors and coverings devised to protect exposed portions, and also a sprinkler system like an automatic fire department, ready to put out a fire as soon as it starts.

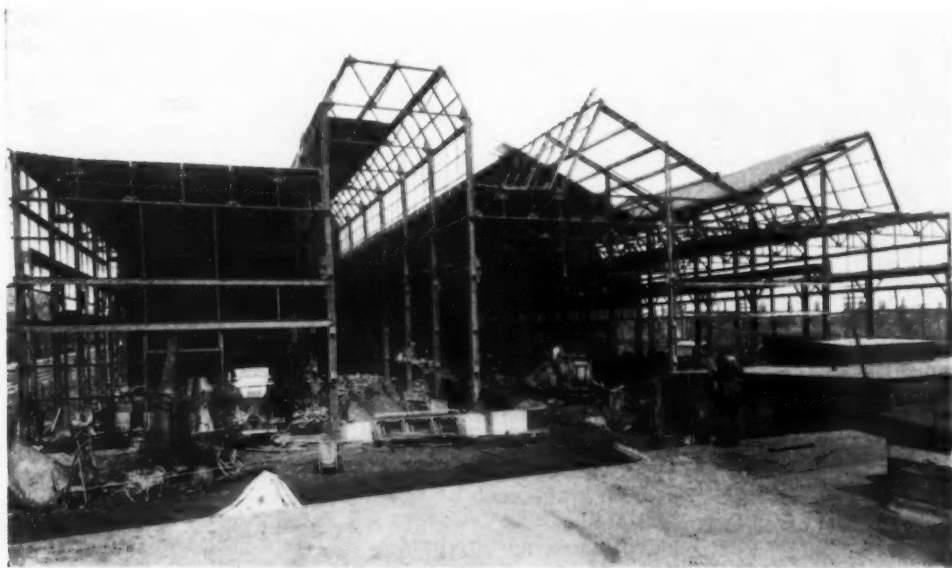
There is no question about knowing how to build so as to prevent destructive fires, as the Factory Mutual Insurance Companies of New England and the National Board of Fire Underwriters have both worked out rules from their experience that will, if applied, accomplish the desired end. The Underwriters' Laboratories of Chicago are just now completing a test of one hundred columns, representing all the kinds in existence. Over two years have been consumed in preparing for and making this test. The columns are full size, heated in a great furnace under an enormous load, similar to that of a high building, and when the columns are white hot (with a heat sometimes over 2,000

degrees), cold water under high pressure is thrown upon them, and the result in each case scientifically recorded. When the test is completed it will be possible to determine how every kind of column for a high building would behave if subjected to a fire such as that at Baltimore or San Francisco.

All such knowledge and all the information and rules of the Underwriters and Factory Mutual Insurance Companies exist for the express purpose of diminishing fire loss, and the only way to accomplish this end is for all concerned to take advantage of this expert knowledge and use it, as it will be gladly furnished to all those about to build.

Physicians and others serving on city and state inspection boards have in recent years rendered valuable service by disclosing conditions in workshops which are injurious and produce diseases, and as a result of these discoveries, many devices and changes have been effected in factories that have improved conditions materially.

Chief among these are sanitation and



BUILDING FOR THE SYMINGTON CORPORATION COMPANY AT ROCHESTER, N. Y.

Parker Thomas and Rice, Engineers. Crowell, Lundorff and Little, Builders. The skeleton steel construction of a type of ammunition plant erected in different parts of the country. The interesting form of roof trusses indicates how light is admitted in the center of such buildings, where important parts of the work are done. Tracks may be seen for the traveling cranes, which are largely used for handling material and products.

plumbing, which have been developed to a higher state of perfection in this country than in any other. American plumbing goods are known the world over.

A great deal has recently been done to improve artificial lighting. When electric lights first came into use, the bright glare from high-powered lights was for quite a while a frequent cause of eye disease, headaches, and nervous affections. Today, scientifically designed fixtures and methods of lighting are made to put the light on the work and at the same time shield the eyes of the worker. General illumination of the interior of buildings is also accomplished now by partially or wholly concealing the bright glare of the illuminants. Where intense rays of light come from the work in hand goggles for the eyes are very extensively used.

For a long time nothing very specific was done to stop or mitigate the injurious effect of dust and poisonous gases. In the most improved factories exhaust pipes have been contrived to remove such injurious gases and dust at their source and prevent their escape into the workroom. In other cases it is quite common for the workmen to wear gas or dust masks in the departments where such conditions originate. Some of the museums have photographs made microscopically of all the different kinds of dusts produced in the industries, and their effects upon the human lungs. There are some specimens of the lungs of coal miners who worked in poorly ventilated mines, that are quite black from the dust. It has been found that up to a certain point the human system can make away with dust without suffering any particular injury, but when such dust becomes unusually thick and is constantly inhaled for long periods, the screening and filtering apparatus of the body breaks down, refuses to work, and tuberculosis usually results.

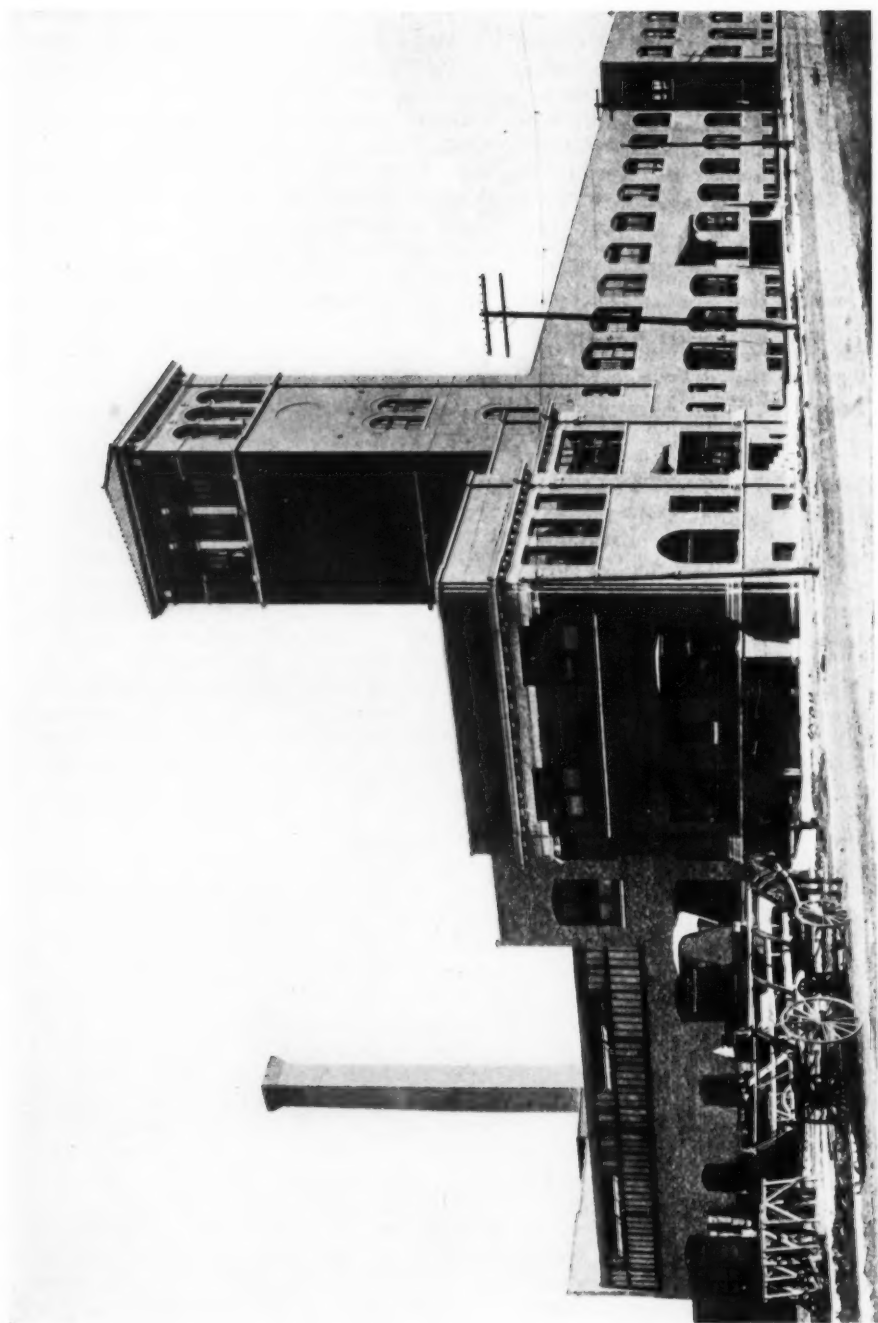
The ventilation of buildings has reached quite a high state of perfection. Natural ventilation in summer through the windows is always good provided the air coming from the outside is pure, but when it is impure, or during cold weather, it is now possible to take the outside air,

screen out the cinders and dirt, wash it, warm or cool it, introduce the right amount of humidity and deliver it to any place in the building desired. In hot summer weather air for ventilation handled in this way can readily be made to lower the temperature in a building 10 degrees below that of the outside air. Such systems also can provide for removing the impure air at the same time. There are instances of buildings when the outside windows are made so as not to open at all and where the change and purification of the air inside is done entirely mechanically.

DISCUSSION OF AN ARCHITECTURAL STYLE FOR INDUSTRIAL PLANTS AND LANDSCAPE TREATMENT OF THEIR SURROUNDINGS.

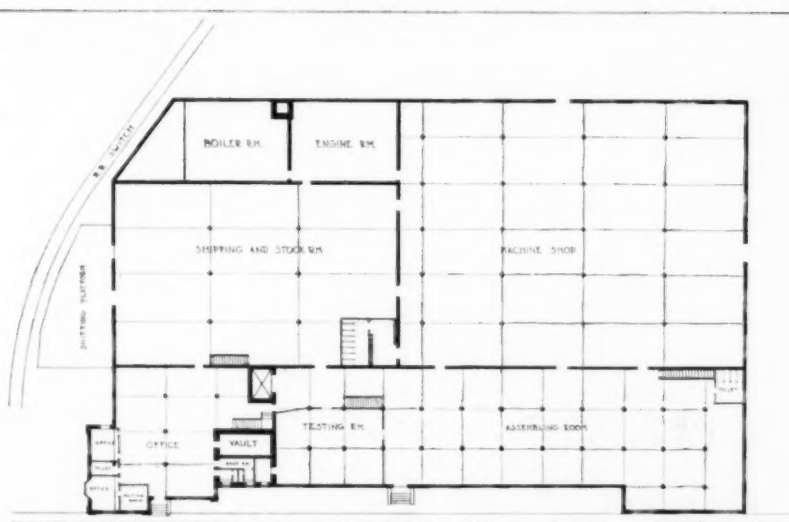
Modern industrial buildings are particularly fitting subjects for treatment architecturally. The varied requirements and functions of these structures are such as can be expressed in designs that are both attractive and beautiful. Many features of such buildings may be treated in the design so as to give an unusual interest and variety to the composition. In fact, they often seem to afford greater freedom and a wider range for expression in mass and detail than other kinds of buildings.

It is probably not true that the designs of such buildings have followed along in the same channel sufficiently to have established as yet what might be called an American industrial style of architecture; yet many designers of these buildings are beginning to indicate a preference for a certain kind of treatment. This statement is first of all logical in being an honest expression of the construction or functions of the building, because the utilitarian nature of industrial buildings, as a rule, prevents the expenditure of much money on elaborate features of a purely ornate character. The design must grow out of what is essential to the objects of the plant. The designers generally seem to have adhered to this requirement faithfully, because the majority of successful designs receive their character from the architectural treatment of base courses, window sills and



AMERICAN ELECTRIC TELEPHONE COMPANY'S BUILDING, CHICAGO.

An example of the application in a simple way of the Renaissance style of architecture. The sprinkler tank is inclosed in the tower, which has a resemblance to the campanile so commonly seen in Italy. The plant consists of a combination of two-story work shops in front with a one-story intensely lighted saw-tooth skylight construction in rear for the delicate operation of winding electric wires, coils and making the other intricate parts in telephone construction.



PLANT OF THE AMERICAN ELECTRIC TELEPHONE CO.
SIMMONS & TELLING ARCHTS.

lintels, cornices, copings, piers, gables, penthouses, entrances, projecting departments, towers and all such features as are essential constructive elements of inclosing walls and roofs.

In fact, a close analysis of what a proper architectural treatment is for a factory building would clearly show that it is simply making beautiful and attractive what has to be there anyhow for utilitarian purposes. The first principle of beauty in designing a building is to mold it into beautiful proportions. There is always some way of accommodating the uses of the building and its construction to pleasing proportions without adding any extra materials or expense. Then the proper treatment of its supports, walls and pavilions will follow naturally in arranging the necessary materials of its construction into forms that are attractive instead of ugly.

This is the kind of beauty and attractiveness in an industrial building that does not cost anything and it is also the most important kind of beauty, as it is the basis and foundation upon which all other beauty and adornment of architecture is built. If the problem is one where there is something more desired

than the effect which will result from a strict adherence in the design to the structural and utilitarian necessities of the structure, then this treatment of the necessary features of the building can be done in a more ornate manner and some parts of the building emphasized by proper architectural treatment that will add materially to the good effect of the whole. Entrances, pavilions, or prominent façades may very appropriately be treated architecturally so as to emphasize them and give them the prominence which they may relatively deserve.

Even if the architectural treatment in this way is carried beyond the first stages above referred to, the extra expense of such treatment does not add materially to the cost of the building. It is surprising that so much can be added to the appearance of a building in this way at relatively small cost.

To illustrate by a single example the relatively small cost of treating a building architecturally in design, two illustrations are given of an industrial building built for the C. P. Kimball Company for the manufacture of automobiles. As a strictly engineering and utilitarian design of this building, if built, would have

resulted in a long three-story box effect with an ugly sprinkler tower and water tank above it, it was desired to have something more than this and consequently the architectural design illustrated was adopted and carried out. In order to determine the actual extra cost of this architectural treatment of the building, two designs were made and estimates taken from contractors for the cost of each. These estimates established the fact that the building with the

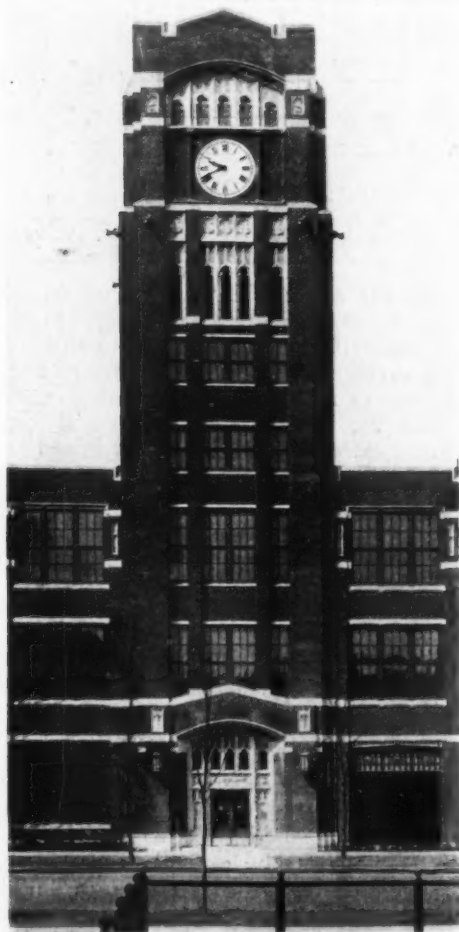
architectural treatment cost approximately 5 per cent. more than the building would have cost if built after the unattractive utilitarian design.

The cost of other industrial buildings by different architects has been estimated to ascertain the extra cost of such architectural treatment, and it has been found that 5 per cent. would represent very well about the average cost of such architectural treatment. It should be made plain, however, that such extra cost would be involved only as in the case illustrated, where the architectural treatment was carried beyond the structural and the utilitarian requirements of the building.

The trend of designers of industrial buildings has been to follow and utilize the materials of the Gothic and Renaissance styles of architecture more than any others, if they followed any of these historic styles at all. A great many plants have been designed very successfully after the Renaissance style, but the majority of designers recently seem to mold their designs with a Gothic tendency. The Renaissance style often demands the use of projecting cornices, which when applied to some types of industrial buildings involve more expense than the Gothic. The upper part of a factory wall can usually be terminated by an ornamental coping that will obviate the necessity of any projecting cornice.

The characteristics of the style of treatment of industrial buildings that is mostly in favor now are Gothic in character and consist usually of piers marked on the exterior of the building, carried up only to the point where the concentrated loads disappear, similar to buttresses, and also walls continued up without projecting cornices and terminated with ornamental copings; the corners of the building are strengthened by the use of piers heavier than the intermediate ones, the entrances emphasized by the use of ornamental tracery and ornament, and the sprinkler tank inclosed in a tower often placed at the main entrance and including one of the principal stairways.

While such designs are Gothic in character they are more and more exhibit-



Water and bell tower of the C. P. Kimball Company's building. The sprinkler tank is behind the clock and the belfry directly below that has a set of chimes consisting of four bells, used instead of a steam whistle for announcing the beginning and end of working hours.

George C. Nimmons, Architect, Chicago, Illinois.



BUILDING FOR C. P. KIMBALL COMPANY, CHICAGO, ILLINOIS.

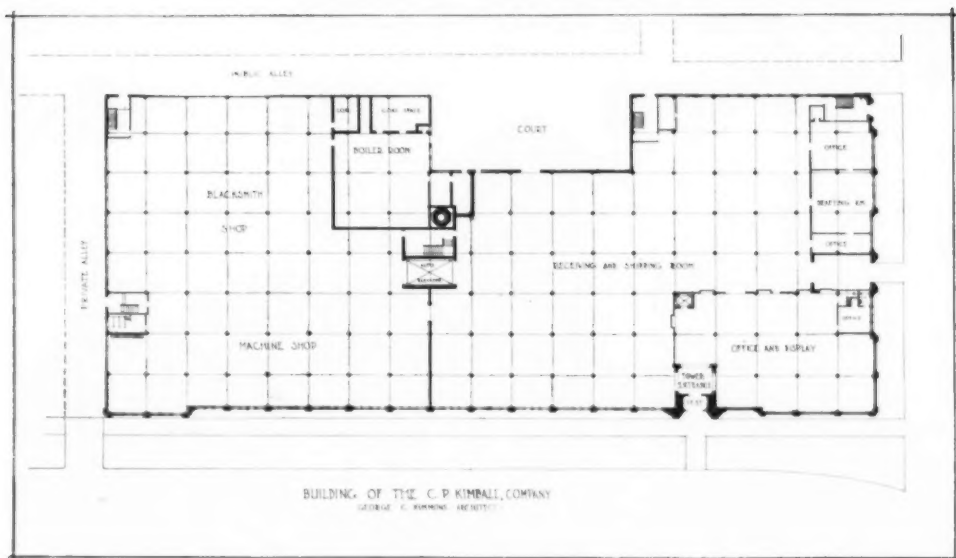
George C. Nimmons, Architect.

The architectural treatment intended to make this building interesting and attractive added only 5 per cent. more than the cost would have been to have built the building after the utilitarian design shown below, according to the contractors' estimate.



1257

UTILITARIAN DESIGN MADE FOR THE C. P. KIMBALL COMPANY'S BUILDING BY THE ARCHITECT TO DETERMINE THE DIFFERENCE IN COST BETWEEN THIS EXTERIOR TREATMENT AND THE ONE SHOWN ABOVE, AFTER WHICH THE BUILDING WAS ACTUALLY BUILT.



ing a freedom and originality that promise in time to develop into a well-defined architectural style for American industrial buildings.

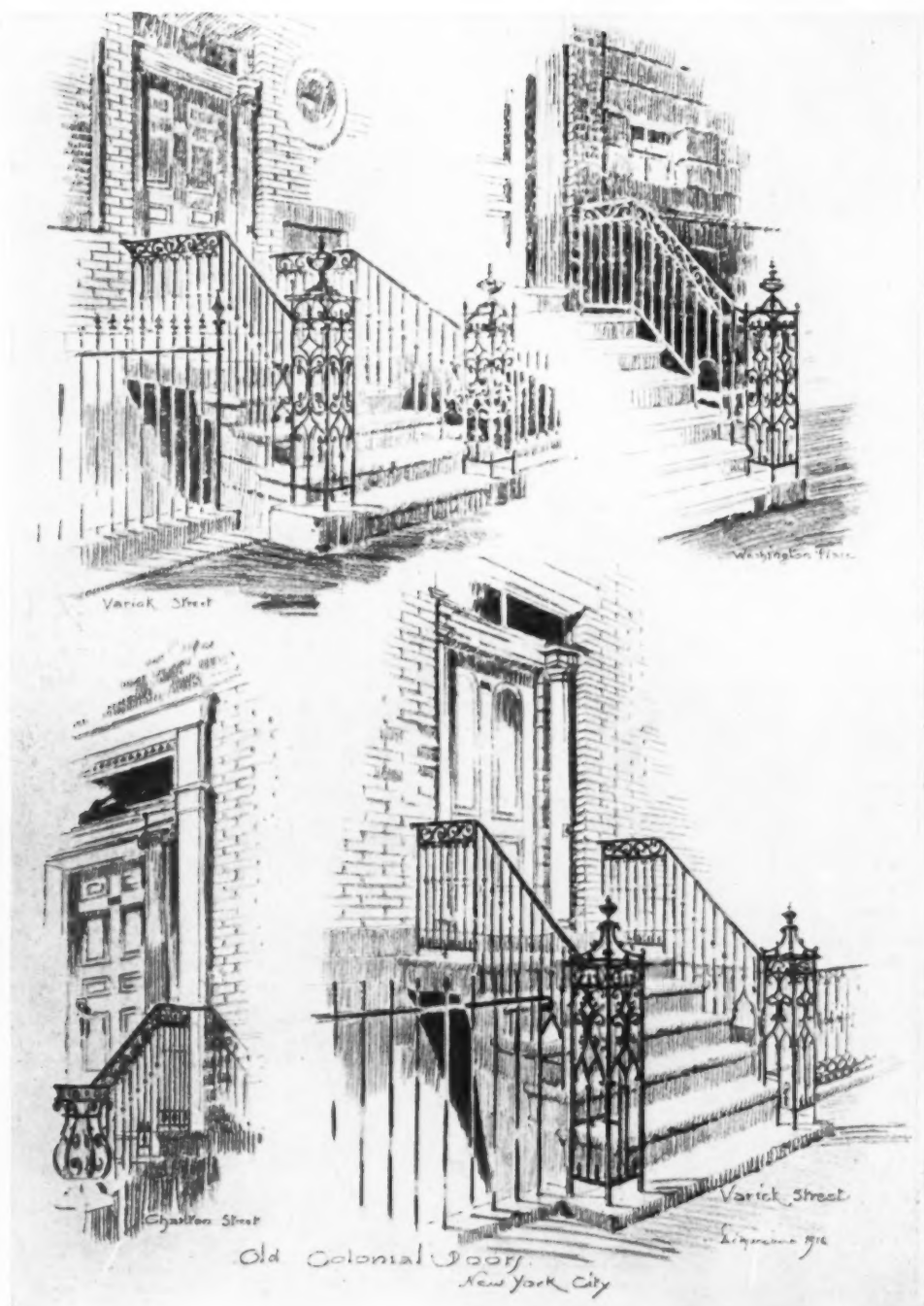
The landscaping of the grounds about an industrial plant has indeed become an important matter, especially since the need for playgrounds and breathing spaces for employees is being so generally recognized. Even if a plant only has a few feet of space as a foreground, it adds greatly to the good appearance of the whole establishment to plant this in grass, flowers, shrubbery or vines. Nothing will give any building of this sort so good a setting as a bit of planting around its base.

When a plant is to be built in the outlying districts of a city it is frequently possible to secure sufficient land for an

ample foreground and space for recreation and playgrounds. No better influence can be brought to bear upon the employees during their noon hour or recreation periods than that which is exerted by the presence of the flowers and green things of nature in the vicinity of their workshops. If it is necessary for the plant to have a reservoir of water for the sprinkler or fire-protection system, this sometimes may be made into a pond bordered with walks, trees, and flower beds and in this way made the dominating feature of a landscape plan, or the playgrounds for some outdoor game may form the center of a small park-like treatment that will add wonders to the attractiveness of the whole place and not infrequently exert an invaluable influence on the morale of the entire working force.



By
John Di Mariano



DRAWING BY JOHN DI MARIANO.



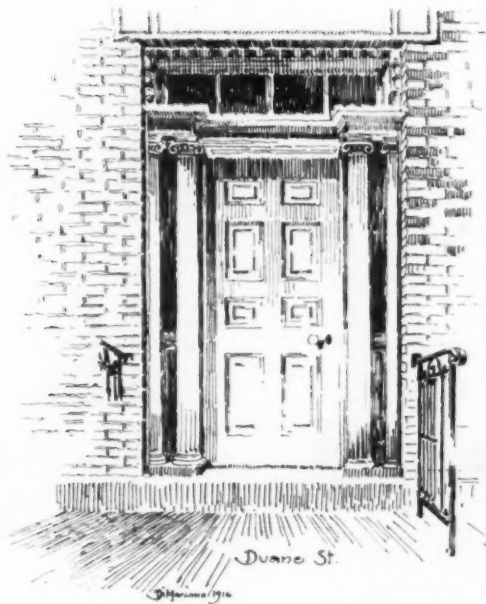
DRAWING BY JOHN DI MARIANO.



Greenwich St.



Carlisle St.



Duane St.



Cherry St.

Old Colonial Doors
New York City

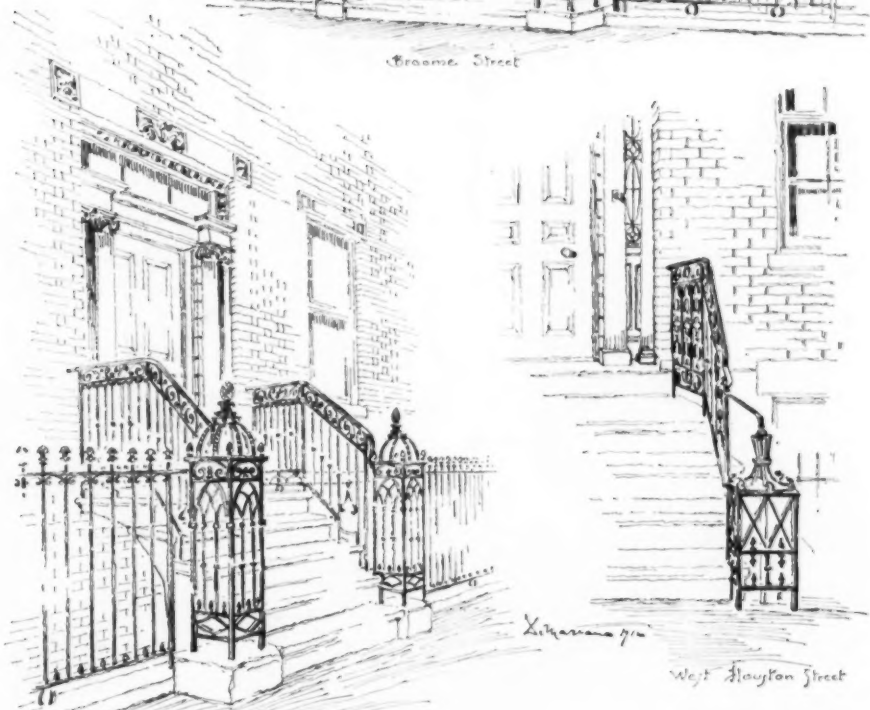
DRAWING BY JOHN DI MARIANO.



DRAWING BY JOHN DI MARIANO.



Broome Street



Macdougal Street

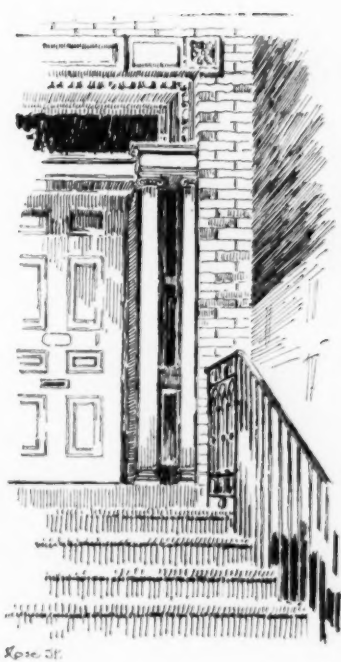
John Di Mariano

West Houston Street

Old Colonial Door

New York City

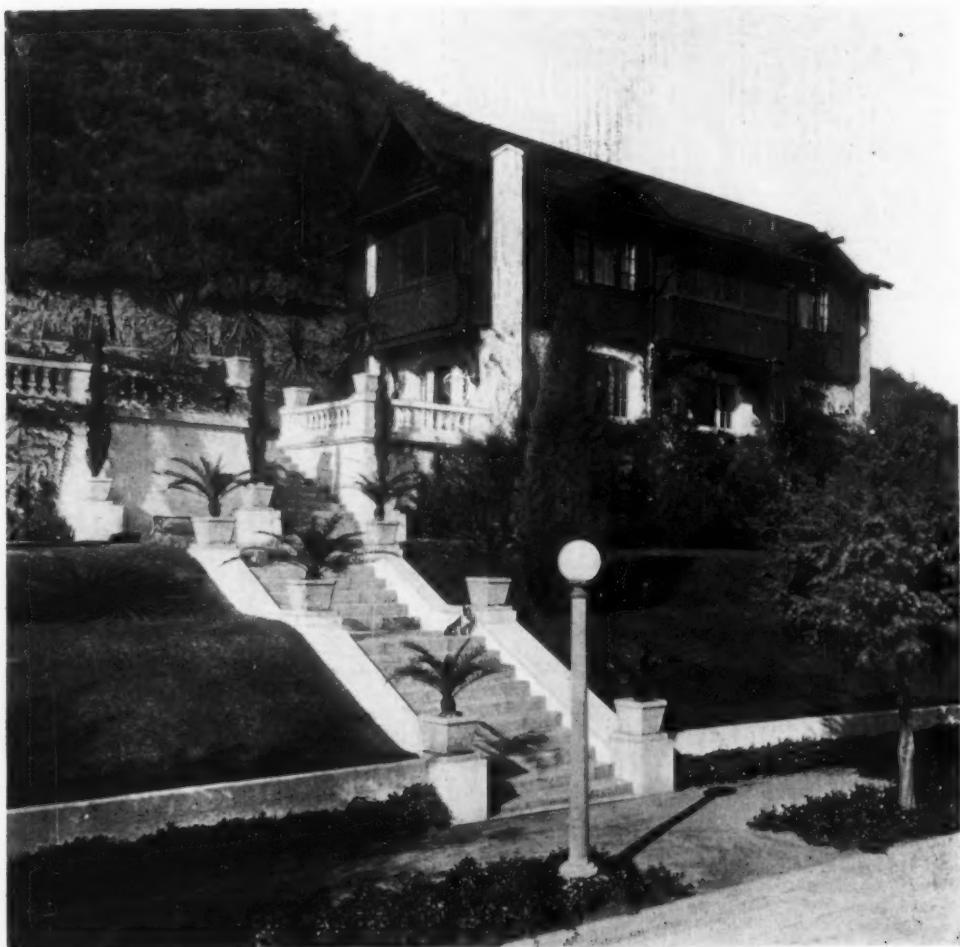
DRAWING BY JOHN DI MARIANO.



Old Colonial Doors
New York City

DRAWING BY JOHN DI MARIANO.

PORTFOLIO
OF
CURRENT
ARCHITECTURE



WINTER HOME OF GEORGE H. CROSBY,
ESQ., MIRA VISTA, PASADENA, CAL.
J. CONSTANTINE HILLMAN, ARCHITECT.
(For text, see page 188.)

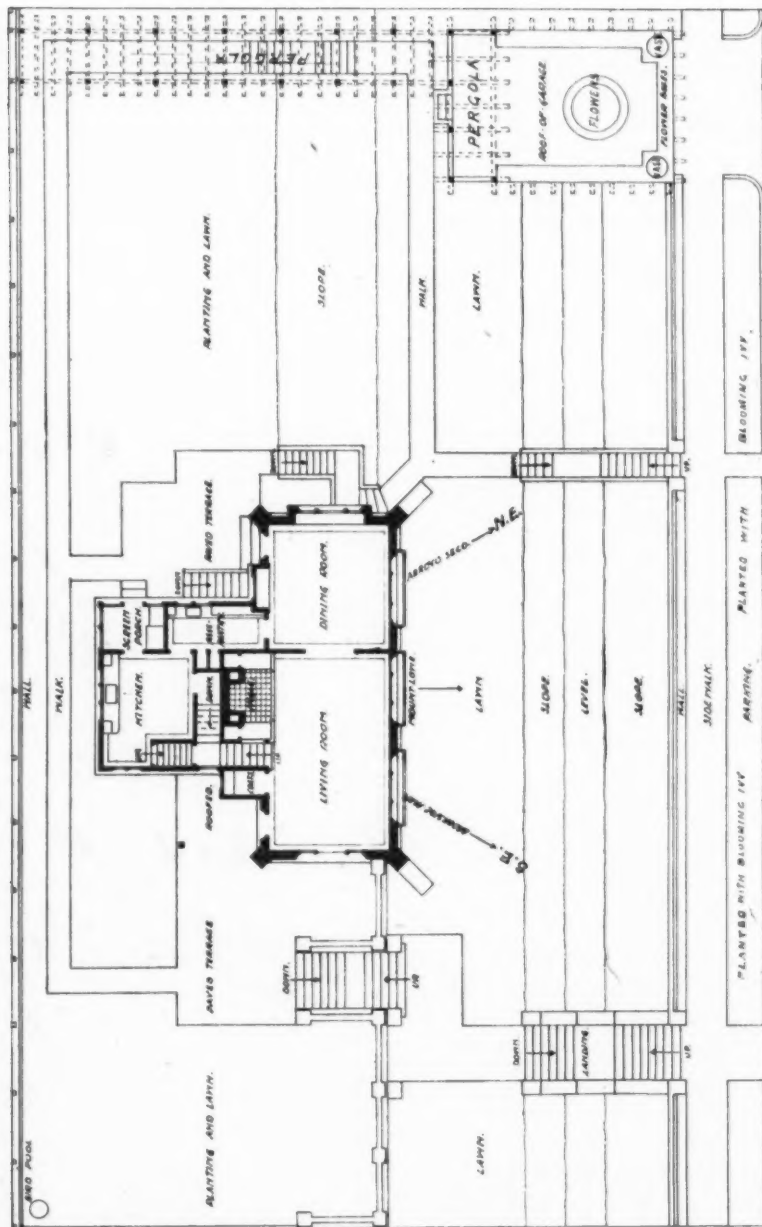


LIVING ROOM, LOOKING INTO DINING ROOM. WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL.
J. Constantine Hillman, Architect.



LIVING ROOM. WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL.
J. Constantine Hillman, Architect.

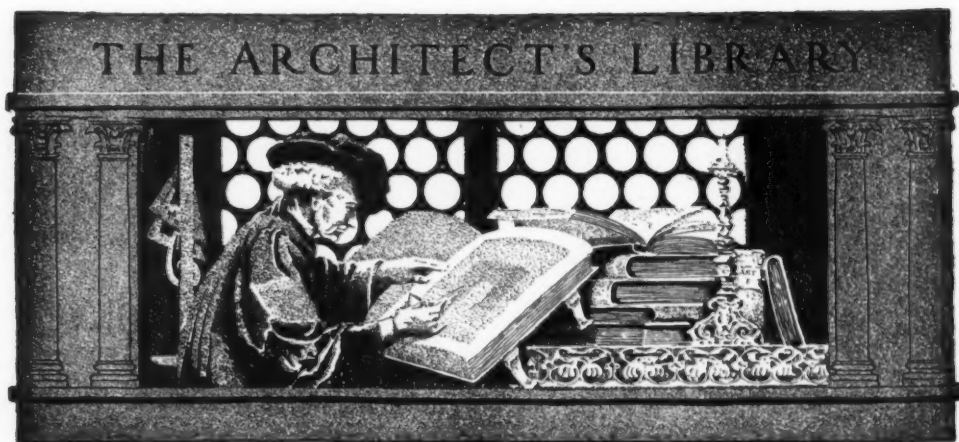
HILLSIDE EXCAVATED



PLAN OF WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL. J. CONSTANTINE HILLMAN, ARCHITECT.



BED ROOM MANTEL—HOUSE OF J. M. R.
TYETH, ESQ., RIVERDALE-ON-HUDSON, NEW
YORK CITY. DWIGHT J. BAUM, ARCHITECT.



WAR BOOKS OF THE CATHEDRALS

By BARR FERREE

Part V.

A Record of Destruction

ONE of the earliest results of the cessation of the war will be an accurate disclosure of the damage done to buildings of historic and artistic merit in northern France. Not one book, but many, will be required to even briefly catalogue these horrors. Much has, indeed, already been published; but the systematic surveys, the careful observations of trained scholars, the results of official scrutiny, have now to come out. The task is a vast one, for the German invaders spread themselves over a large territory and destroyed thousands of monuments. A scientific account of this destruction is a work of immense magnitude. Not only must many buildings be described and their injuries noted, but in many cases whole cities and towns have been so nearly obliterated that everything they contained must be summarized and catalogued. Several years may well elapse before the full effect of the German horror can be accurately known.

The first considerable book to be published in France dealing with German destructiveness is *Les Monuments Français détruits par l'Allemagne*, by M.

Arsene Alexandre. It is dated 1918 and was printed at Nancy by its enterprising publishers after the sixteenth bombardment of that city by long-range guns, and the hundred and twentieth attack by aviators. Appearing before the signing of the armistice, it was written some time before and does not, therefore, summarize the colossal injuries of 1918. Amiens, for example, is not mentioned, but is referred to in a slip pasted onto the first page, in which mention is also made of the latest horrors at Reims. In a sense, therefore, the book appeared a little too soon, but as a record of wicked hate toward beautiful buildings it is so appalling as to give a German pause. The author is Inspecteur Général des Musées, and his book is an inquiry made by the direction of M. Albert Dalimier, Sous-Secrétaire d'État des Beaux-Arts. It may thus be regarded, in a sense, as an official publication of the French Government. M. Alexandre is the joint-author with M. Paul Ginisty of the admirable *Le Livre du Souvenir*, a traveler's guide to invaded France, published in 1916, and previously referred to in these notes.

The present book is a volume of two

hundred and eighteen pages, with forty-seven plates containing two hundred and forty-two reproductions of photographs. With a few exceptions all of these illustrations are of ruined buildings, many of them hardly more than formless masses of rubbish. They constitute the most terrible indictment of German ruthlessness toward buildings that has yet been made. Nothing escaped the mad passion of the invaders; no building was too magnificent, as the cathedral of Reims so eloquently testifies, or too insignificant, as many a picturesque little house now gone forever establishes, to escape destruction if their guns could reach it. M. Alexandre marshals the whole hideous array in due order, taking up his subject by departments, and then by cities and towns, noting the more essential injuries done in each instance. It is a veritable nightmare of evil, a thing so monstrous as to seem unreal, even with the photographic proof before one. And all this ruin was done, as the whole world now knows, without the smallest advantage to the destroying invaders. Down-right wickedness; that, and nothing else.

M. Alexandre opens his book with a study of the German mind and an examination of the German position with reference to destroyed monuments. He examines the arguments for Kultur and the German antagonism to the French. At the time these pages were written such topics may have had some interest; they have none now. No one any longer cares to study the German mind, for its practical results, as this book so eloquently shows, prove it to be unworthy of consideration. And Kultur and its pretensions now rank with such ineffectual curiosities as the Keely motor or the long since exploded moon hoax. What they thought, and why and how, is of no consequence whatever in the face of what they accomplished. For four years they did as much evil in the world as they could; M. Alexandre, with high official backing, can only summarize a part of it.

Notwithstanding the care with which this introductory chapter has been put together, and a very good piece of work it is, M. Alexandre himself would prob-

ably be the first to disclaim any importance for it. The great merit of his book is its systematic survey of the German ruination. This he has done as thoroughly as the conditions prevalent at the time of writing permitted. As the first comer in a field destined to be largely occupied, he has a real advantage, and, painful as his book is to read, because it deals with a most painful subject, it nevertheless merits a hearty welcome.

This book is an entirely new kind of architectural history. In the calm days that preceded the German eruption, an architectural history was a history of progress. The historian set out to trace the history of his subject from its earliest manifestation to its culmination. It is quite true that, to bring his story down to modern times, many a collapse and many a step backward had to be noted. But the Germans have brought about the need of writing a new kind of architectural history, a history of destructiveness, and of destructiveness in its most wanton phases. For the first time since books have been made has an author been able to prepare a stout volume on so interesting a subject as fine buildings, beautiful buildings, good useful and ornamental buildings, about which nothing is said but their destruction or injury.

Literally, of course, this is not true, for M. Alexandre briefly sketches the history of some of the more notable structures mentioned. But his theme is not upbuilding, but throwing down. If he feelingly describes the beautiful little church of Tracy-le-Val, it is only to refer the reader to his photograph showing it now to be a mere heap of stones. And, indeed, we are too painfully reminded that, were the early history of most of the buildings illustrated in this book fully known, it would be possible now to prepare a complete and final history of them; for many of them no longer exist. In too many cases they have been utterly swept away by the German guns, or unavoidably destroyed by necessary French bombardment; or they have been so gravely ruined as to be no longer returnable to their original condition.

Of the cathedral cities injured in the war mention is made of Arras, Lille,

Nancy, Reims, St. Dié, St. Omer, Senlis, Soissons, Toul and Verdun. The cathedrals of most of these places have been more or less injured, some very considerably so. The notes on Lille are summary only, for it was still in German hands when the book was written. The cathedrals of St. Omer and of Toul do not appear to have been injured. Amiens, Châlons-sur-Marne, Laon, Meaux and Paris are not mentioned.

It is, however, ungracious to find fault with M. Alexandre for not including in his book records of destruction wrought after it was written. It is the most extensive survey yet produced of German injuries in France. It is concerned not only with cathedrals and churches, but with civic buildings of all kinds. For many buildings of special note admirable sketches of their history are given, so that the most uninformed may know exactly what the world has lost. It is a book certain to fill the mind of any friendly reader with lasting regret that so much that was good and beautiful should have been so ruthlessly injured. And Germans, we may hope, may well feel undying shame for their own responsibility for this hideous ruin.

The cathedral of Reims is the most important French building to be seriously injured by the Germans. M. Alexandre gives several pages to it, presenting a brilliant sketch of its architectural history and noting such misfortunes as had happened at the time of writing his book. But as the Germans bombarded the cathedral to the very last day of their occupation of the vicinity, much happened later that he could not refer to. In this connection special interest attaches to an article on the actual state of Reims, published in the great French illustrated weekly, *L'Illustration*, of November 2, 1918. It is by M. Max Sainsaulieu, the architect of the cathedral. Nearly a hundred hectares of the area of the city is covered with buildings totally demolished, while all the others, he adds, are more or less bombarded. He briefly notes some of the more important structures that have been badly hurt, a grievous list. Much injury was done to the great abbey church of St. Remi. As

for the cathedral, it rises in an immense field of calcined walls.

M. Sainsaulieu notes the loss of many of the more important statues on the exterior of the cathedral, some of which have utterly disappeared. The beautiful statue of the "Beau Dieu" of Reims, the famous figure of the blessing Christ at the portal of the Last Judgment, has been decapitated. Many pinnacles and architectural parts of the exterior have disappeared, and some of the vaults have been pierced. That the great roof, with its magnificent ancient woodwork, had gone has been known from the days of the first great fire. But M. Sainsaulieu is not discouraged. The towers and the larger part of the structure remain firm and steadfast and he looks to a restoration that will bring the cathedral to its original splendor. Possibly this can be accomplished; meanwhile, it is good to have the opinion of so competent a judge on this highly important point.

THE MEANING OF ARCHITECTURE

HERE at last is a book on architecture* that is not solely concerned with the relics of a dead past, but has something to say of the living present and of that future whose birthpangs we are shortly to endure. It treats of architecture as an art of expression, not as a book of fashions or a bag of tricks.

Architecture is the expression of the psychology of a people, a record of their thoughts, their tastes—even their hopes, their dreams. But according to Mr. Pond it is more than this. A work of architectural art is primarily an expression of itself—the inner nature of its own becoming; a dramatization of those invisible physical forces which both maintain and menace it.

To the extent that architecture becomes thus expressive and dramatic, it enters into relation with human life, and becomes expressive of that also, for the reason that the physical forces which de-

*The Meaning of Architecture. By Irving K. Pond. Boston: Marshall Jones Company. Price \$2.

termine structure have their correlatives in those obscure mental and psychic impulses and inhibitions which mould and modify character, and so determine destiny.

The manner in which Mr. Pond establishes and illustrates this thesis is more than ingenious. It would be unfair both to him and the reader to attempt to summarize his argument within the limits of a brief review, but in general he identifies that rising and resisting force which finds expression in the column with the will-to-live, to adventure, to achieve; while that Nemesis which says to man "thus far shalt thou go and no farther" he finds symbolized in the horizontal entablature—fate as opposed to freedom. The "conflict" between these two, and their beautiful reconciliation find expression, at the hands of the artist, in those diverse forms and ornaments which mainly characterize the so-called historic styles. In these forms and ornaments Mr. Pond finds appropriately and variously symbolized the forces of compression and tension actually operative within the structure—they tell what is "happening" there. And from the larger, philosophic view, they tell also of those psychic forces which press and pull, urge and arrest us throughout a life which, like a church or a temple, may be made to show forth an admirable adjustment of effort ending in exquisite acquiescence.

Such a view of "the meaning of architecture" is an incentive to new achievement, for it vitalizes and humanizes an austere art, and contradicts the vicious teaching which is numbing the brains of so many pupils in architectural schools—a teaching which is summed up in the phrase "All we can do is to study and re-study, to refine and re-refine the elements left us by the past."

Not so Mr. Pond: "Dramatize, dramatize!" is his more heartening message to the eager spirit of youth. He urges us to discover the right dramatic expression for the forces which play through the frame of a modern sky-

scraper, and the correlative forces at play in modern American life, that architecture may again become a living art. He does not minimize the difficulties, and that it is a task impossible of accomplishment by any single individual he is particular to state. His own attempts to apply his metaphysic to modern problems enforce this truth, and give point to Schopenhauer's dictum that "the concept is unfruitful in art." If we compare Mr. Pond's skyscraper sketch with the somewhat similar Woolworth building tower, it is clear that the author of that beautiful obelisk "followed the rules without knowing them" more effectively than Mr. Pond with all his knowledge; and however accurately his ornament may express the play of concealed forces, it is far less beautiful than that developed by Mr. Louis Sullivan, for example, and by so much less truly representative of the *elan vital*.

For "Beauty is truth; truth, beauty," and if anywhere a beauty is discovered which refuses to submit itself to Mr. Pond's or anyone else's formula, we may be sure that there is some larger synthesis which includes it too.

The Meaning of Architecture is a book into which the author has poured out his mind and his heart. To books of this order justice is never done by an exercise of the mere critical faculty. One might say that Mr. Pond's style, both in writing and drawing, is singularly lacking in charm; that he is intolerant of points of view and methods of work at variance with his own: even at times exhibiting a certain truculence toward others, sincere as himself, who follow a different dream. But it is better to let such thoughts submerge themselves in a great gratitude that a sincere, strong, thoughtful spirit has spoken words of truth, encouragement and wisdom to those who, in quest of architectural beauty, follow a long and dusty road, lined with the ruins of ancient grandeurs, leading they know not where.

CLAUDE BRAGDON.



- Thirty-sixth Annual Catalog of the University of South Dakota 1917-18. Announcements for the year 1918-1919. 286 p., 7¾ by 5 inches. Published by the University, Vermillion, South Dakota.
- Lessons on Form. A Manual of Free-Hand Drawing. By A. Blunck, Architect. Revised American Edition, 104 pages of drawings, 20 p. text, 12 by 9 inches. Cleveland: J. H. Jansen. Price \$3.00.
- Heating and Ventilation. By John R. Allen and J. H. Walker. Many ills., 305 p., 9½ by 6 inches. New York: McGraw-Hill Book Co., Inc. Price \$3.00 net.
- The Johns Hopkins University Circular. Announcements for 1917-1918. Edited by Thomas R. Ball. 408 p., 9 by 6 inches. Published by the University, Baltimore, Md.
- Fuel Economy in the Operation of Hand Fired Power Plants. Many ills., 94 p., 9 by 6 inches. Published by the University of Illinois, Urbana. Price 20c. per copy. European Agent, Chapman & Hall, Ltd., London.
- University of Oregon Bulletin, School of Architecture and Allied Arts. Many ills., 43 p., 9 by 6 inches. Published by the University of Oregon, Eugene.
- Silk and Manufacturers of Silk. Schedule L. 163 p., 9 by 6 inches. Washington: The Government Printing Office. (United States Tariff Commission—Tariff Information Series No. 3.)
- United States Tariff Commission. Outline of Its Work and Plans. 13 p., 9 by 6 inches. Washington: The Government Printing Office.
- The Vermont Bulletin Catalogue Number 1917-1918. The University of Vermont and State Agricultural College Announcements for 1918-1919. 211 p., 5 by 7½ inches. Published by the University of Vermont, Burlington.
- As a Man Liveth. Published by the Associated Metal Lath Manufacturers. Many ills., 31 p., 8¾ by 11¼ inches. Cleveland: Associated Metal Lath Mfrs. Price \$1.00.
- American Journal of Archaeology. Second Series. The Journal of the Archaeological Institute of America. Issued Quarterly. Many ills., 250 p., 9½ by 6 inches. New York: The MacMillan Company.
- The Bulletin of the Pennsylvania Department of Labor and Industry. A Bulletin of Information for the Public. Volume V. Series of 1918. No. 1. 176 p., 9 by 6 inches. Harrisburg, Pa.: J. L. Kuhn.
- Fire Waste in Canada. By J. Grove Smith. Ills., 319 p., 10 by 7 inches. Ottawa: The Commission of Conservation. Price 50c.
- University of Wyoming Bulletin. Issued by the University of Wyoming. 259 p., 5¼ by 8 inches. Laramie, Wyoming.
- Columbia University Bulletin of Information. Catalogue, 1917-1918. 442 p., 6 by 9 inches. New York City: Columbia University.
- Teton Sioux Music. By Frances Densmore. Smithsonian Institution Bureau of American Ethnology Bulletin 61. Many ills., 561 p., 9½ by 6¼ inches. Washington: Government Printing Office.
- The Studio Year Book of Decorative Art. A Review of the Latest Developments in the Artistic Construction, Decoration and Furnishing of the House, 1918. Many ills., 96 p., 8½ by 12 inches. New York: John Lane Company.
- A Directory of Engineers, giving a brief synopsis of the experience and training of each of the members of the Association, 6 by 9 inches, 192 p. \$2.00. Classified tables have been compiled based on experience, so that it is possible to find a consulting engineer, an executive or a subordinate having specific experience and living in any definite locality. Thus if one needs a consulting hydraulic engineer, or a designer of machine parts, he is able to find men having this experience through the aid of the classified tables.
- Concrete Stone Manufacture. By Harvey Whipple. Second Edition Revised and Enlarged. Many ills., 318 p., 7 by 5 inches. Detroit: Concrete-Cement Age Publishing Co.
- University of Illinois Bulletin. Tests to Determine the Rigidity of Riveted Joints of Steel Structures. By Wilbur M. Wilson and Herbert F. Moore. Bulletin No. 104. Ills., 60 p., 6x9 inches. Published by the University of Illinois, Urbana.
- Loan Exhibition of Tapestries, Assembled, Arranged and Catalogued by George Leland Hunter. 28 p., 6 by 9 inches. The Cleveland Museum of Art, October 5 to November 17, inclusive.
- Storing. Its Economic Aspects and Proper Methods. By H. B. Twyford. Illustrations, 196 p., 9½ by 6 inches. New York: D. Van Nostrand Co.

NOTES AND COMMENTS

The Sunken Garden in Brackenridge Park, San Antonio, Texas

It is always refreshing to discover a piece of work which shows the touch of inspiration, and it is especially gratifying to find that quality in municipal improvements. We rather expect stereotyped ideas in public works because of the omnipresent politician and of the many unavoidable limitations imposed by city conditions. Even in cities, however, there are often irregularities of topography which offer opportunities for interesting development. All too frequently these possibilities are not recognized, but instead some pre-conceived scheme is chosen (borrowed probably from some spot where entirely different conditions obtain), hollows are filled, hills cut away, and in the end most of the natural charm is destroyed and an artificial "effect" produced.

A rare exception to this rule and a remarkable example of intelligent adaptation of design to existing conditions is a most beautiful little garden which forms a feature of one of the parks of San Antonio, Texas. An old stone quarry, containing a miscellaneous assortment of tin cans and other evidences of civilization, disfigured a corner of Brackenridge Park, and in the ordinary course of events would have served as a city dump until level full. But fate placed a man of vision in the office of Park Commissioner, Mr. Ray Lambert, who had as adviser Mr. F. F. Collins, an enthusiast on the subject of city planning and creator of the famous Collins Gardens.

War conditions had cut down the Park Commissioner's force of men and the funds at his disposal, but he had seen his opportunity and that was sufficient. The man who had formerly worked the old quarry was induced to contribute a supply of ce-

ment, laborers were borrowed from the various city parks, a small gang of prisoners was commandeered from the jail, and with nothing to work from but a mental picture and a few stray photographs of Japanese gardens and tea houses, he started in.

The rubbish was cleared away, pools were dug in the quarry bottom, islands and bridges were built of the loose stone,



CORNER OF THE SUNKEN GARDEN, BRACKENRIDGE PARK, SAN ANTONIO, TEXAS.



CONNECTING POOLS IN THE SUNKEN GARDEN, BRACKENRIDGE PARK, SAN ANTONIO.

paths were cut into the surrounding walls, and rich soil was brought in for flower beds. At one side a curious pavilion was built, partly upon the bank and partly overhanging the water of the pool below, from which two of its massive rough stone columns tower to the roof of palm leaves.

One approaches the garden along an "Alpine Drive" skirting the edge of the encircling cliff, and scrambles down into it by tortuous pathways which branch out to all parts of it in the most unexpected manner. Down the precipitous walls, around the edges of the lily-strewn pools and across the fascinating little arched bridges they lure one on with scarcely

weird pocketful of loveliness, lighted apparently by large fireflies, the contrast with the city park on one side and the mesquite waste on the other produces an eerie feeling that lingers long about one.

For some reason photographs fail to show the beauty of the place. They lack the atmosphere, they lack the color, they do not convey the sense of seclusion produced by the high protecting walls of ragged stone; above all they cannot convey to the mind of the absentee the striking contrast between the daintiness of this Lilliputian garden and the vastness of the Texan plain which forms its setting.

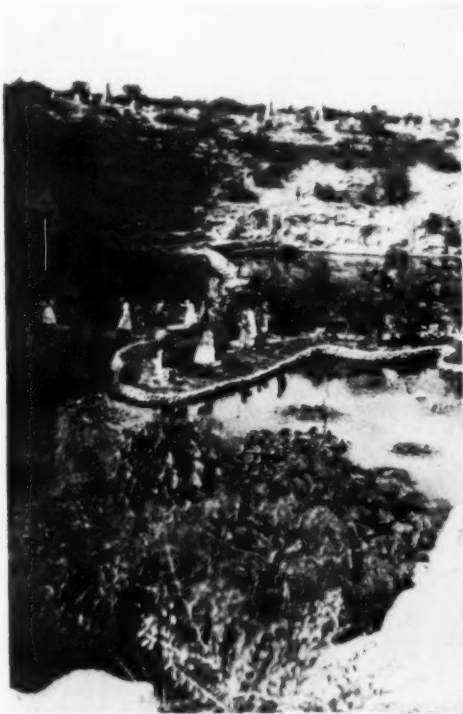
I. T. FRARY.



JAPANESE MOTIFS IN THE SUNKEN GARDEN, BRACKENRIDGE PARK, SAN ANTONIO.

a thought as to where one's footsteps lead. It is a bit of fairyland nestled into a hollow scooped from the mesquite plain.

Beautiful as it is by day, one should visit it after night-fall to experience to the full its mystic spell, for concealed among the flowers and shrubs and dotted over the rocky walls are myriads of electric lights giving an uncanny sense of unreality.



THE SUNKEN GARDEN IN BRACKENRIDGE PARK, SAN ANTONIO, TEXAS.

Early American Country Churches.

On a trip through southern New Hampshire and Vermont I gleaned the accompanying snapshots of a group of interesting Colonial churches. They are in marked contrast with those seen on a Western trip, none of the latter comparing in beauty or dignity with the least pretentious of these.

The church at South Acworth, New Hampshire, was built in the period that came under Gothic influence, the early part of the nineteenth century. Alterations have been made, destroying the symmetry of the facade, but leaving the simple Colonial outline and the white spire.

The Gothic in this church extended only to the window heads and to the detail around the base of the spire. The general outline remained Colonial, although the detail of the corner boards was affected

by the Greek revival. There is a queer jumble of styles, but the whole effect was not marred; the building retains the character of the "white church."

The church at Fitzwilliam has been made over into a town hall, but the fine spire is being preserved. The number of people passing in and out of a weekday rather startles one at first sight.

It is unfortunate that the country churches being built throughout the West cannot take the best of these Colonial churches as models rather than the non-descript styles that have been so popular recently.

FRANK A. BOURNE.

A Winter Residence in Southern California.

Not many years ago the district known as Mira Vista was added to the corporate limits of Pasadena, the famous winter residence town of Southern California. It is on the west of the Arroyo Secco and north of the new Linda Vista Bridge, which crosses the Arroyo. It runs along the base of a range of hills, several hundred feet high, which extends from the new Colorado Street concrete bridge northward to the Devil's Gate. A well improved road follows the foot of the range, intersecting the roads that focus at the Devil's Gate, the gateway of the mountain district to the northwest. From this range lovers of beautiful scenery command a view over the Arroyo Secco toward the most beautiful suburban section of Pasa-



CHURCH AT SOUTH
ACWORTH, N. H.



CHURCH AT WEST RINDGE,
N. H.



M. E. CHURCH AT TOWNS-
END, MASS.



CHURCH AT ACWORTH,
N. H.

dena, to the east; to the northwest lies Altadena, behind which rise the mountains of the Sierra Madre range, of which Mount Lowe and Mount Wilson are known to all travelers; to the east of the range, eighty miles away, "Old Baldy" towers, snow-capped during half of the year. Toward the southeast the view across the Arroyo takes in Brookside Park, in the valley.

Buildings on the west side of the road overlook those on the lower east side. Sites on the west side literally have to be dug into the hill.

Such was the site selected by George H. Crosby, of Duluth, Minnesota, and turned over for development to J. Constantine Hillman, architect, of Pasadena. His main instruction to the architect was that the view from the house must be preserved and utilized. The perspective photograph tells the result quite graphically. There you can see the wild uncultivated hill and part of the bank of still uncultivated earth behind the house not yet overgrown by vines, as it will be. The great problem for the architect, with a cross section of the ground before him, was to decide upon a finished section that would put the house at the proper elevation from the road, so that it could have a basement underground and a first story approach with terraces, which might afford entrance by short flights of steps and still make it possible to have a garden under the brow of the hill. It was also necessary to provide a stairway to the service end of the house and to have a basement entrance. A garage had to be built at the north end of the site, placing it on the street level and surrounding it on three sides with a heavy concrete retaining wall. The two terraces, parallel with the street, abut on this wall. The concrete roof of the garage is near the level of the narrow lawn and garden which surround the house, the garden being carried over the garage, where it is surrounded by a balustrade with pedestals, similar to those seen on the south of the house.

Everything in the general arrangement finally carried out is subservient to the necessity for preserving the views from the house as well as the views of the house.

The house itself is quite small, yet it provides for every comfort and convenience that could be desired. But, above all, it is planned and built to give prominence to the superb pictures that are framed by the five windows in the two

main rooms of the first story. Some suggestion of the window views may be obtained from the illustrations of the living room and the dining room.

It might be said in criticism that placing so many large immovable plate glass windows is not wise in a hot climate. But that falls when it is remembered that this is a winter residence and is built to be occupied only five months in the year.

The exterior design of the house was the subject of much thought on the part of Mr. Hillman. All the terraces and stairways are finished in concrete. The house is of frame construction, the first story being finished on the outside with cement plaster on galvanized steel lathing. The second story is an example of rational wood construction, carried out in red-wood and oiled. Mr. Hillman said he could not feel satisfied with his design for a red-wood second story and roof on top of a white first story until he had added the four buttresses at the corners, which look much like chimneys. They are ornaments used solely for an esthetic purpose and are slightly battered, with a curved profile in the first story. The three latticed sleeping porches on the second story are interesting additions to the house.

PETER B. WIGHT.

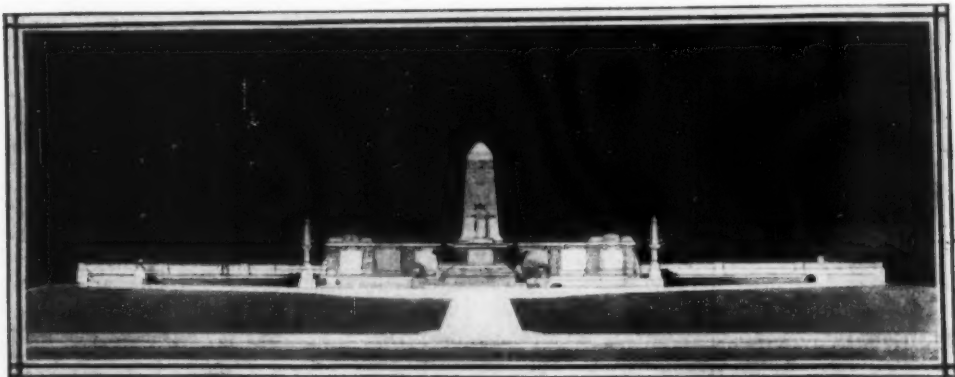
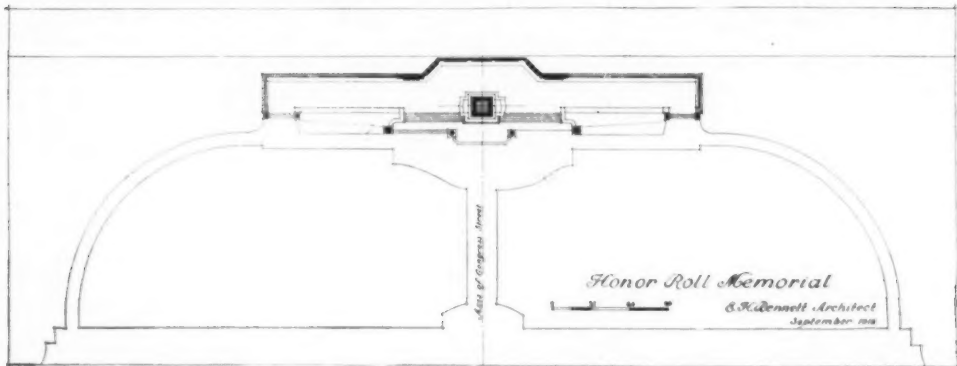
A Proposed War Memorial

Plans have been drawn for the erection of an Honor Roll Memorial to Chicago men who have lost their lives in the service. It is designed to carry their names and is in the truest sense a Dedicatory Monument, one which symbolizes the dedication of an entire city to the purpose of winning the war, as it was realized that a complete memorial could be erected only after the close of hostilities. That point has now been reached and it is probable that a permanent memorial will take its place.

The site selected was the Lake Front, on the center line of the layout of Grant Park and of the downtown center of Chicago—Congress Street. The plan was promoted by the following committee:

Alderman Joseph O. Kostner, Chairman; Mrs. Heaton Owsley, Mr. Charles L. Hutchinson, Mr. Frank Logan, Mr. Charles H. Wacker, Mr. Pompeo Coppini, Col. Nathan W. MacChesney, Mr. J. E. Williams, and Mr. E. H. Bennett, architect.

It was understood that the sculpture would be done by members of the Western



Society of Sculptors. It was proposed to execute the work in staff as a temporary monument and owing to the approach of winter very limited time was available for the design.

In connection with this matter full acknowledgment is made of the invaluable collaboration of Mr. Earl H. Reed, Jr., and Mr. Edmund S. Campbell, architects of Chicago, in this design.

EDWARD H. BENNETT.

A Proposed War Memorial At San Francisco

Mr. Willis Polk urges the adoption by San Francisco of an idea proposed by the Art Association for a survey of the metropolitan area, a plan of which is outlined in the following report of a meeting in San Francisco to discuss the question:

A National War Heroes Memorial is already a local project in many cities, villages and hamlets the world over.

In many instances this movement only comprehends a temporary triumphal arch

of welcome to returning soldiers, to be later constructed in permanent form as a memorial to the heroic dead.

Some of these projects will undoubtedly be carried through, most of them probably will be hastily conceived, poorly executed, and represent nothing but a spontaneous desire to pay tribute to the valient crusaders who died that democratic freedom throughout the world might prevail.

San Francisco has announced that she will contribute her portion to this concrete demonstration of a world's appreciation. Since she has said so, she will do it! That she will try to do it right cannot be questioned. Will she be deliberate enough to do it best?

The Art Association, so that such a memorial may be a perpetual inspiration to all who strive for high ideals, proposes that it take the form of a comprehensive survey of the entire metropolitan district covering the city and bay communities, upon which not only present but all future developments of this territory be planned. Small ideals of the present would be but details in such a plan.

A great plan, for a great future, along

artistic as well as economic and practical lines is proposed. This, indeed, would be a memorial of truly magnificent proportions! We must do it.

To do it there must be instituted an office in which a few young men and women would take up a serious study of all phases of the problem, under direction of a board composed, among others, of a number of architects, painters and sculptors. At stated intervals (once each month would be often enough) this board should review, in a spirit of academic criticism, the work of the students.

Under such a scheme community service could be organized, community spirit crystallized, and community thought analyzed and concentrated. In other words—with the will, and with the spirit to do the best for our community, we ought to get the best.

This may sound chimerical and in the category of dreams, but, after all, what is the work of big men but dreams come true!

If the Art Association will take the lead in this matter the big men of this community will back it up. 'Tis only the little man that hesitates, 'tis only the timid man that fails.

You hear much at this time of after-the-war-business-conditions. An indefinable dread of the Bolshevik, the I. W. W. and the revolutionist is in the air. But, never fear—such revolutionists are but feeble-minded children—the war itself has been the greatest revolution in history. A revolution against autocracy, tyranny and Kaiserism. The revolution has succeeded. The world is free. Long live the revolution!

Therefore, Be It Resolved, That it is the sense of this meeting that the consideration of the proposed memorial be taken up by the San Francisco Art Association along the lines above set forth, and

Be It Further Resolved, That the Mayor and Board of Supervisors, and others interested, be requested to collaborate with the Art Association toward the consummation of this plan.

In this way the projects of all will receive the highest artistic consideration—the destiny of a people, the fame of a city, must ever be inseparably coupled with Beauty.

San Franciscans know this. Citizens—do your duty!

Athens, Venice, Paris, Washington. Next?

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make

big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty."—Daniel H. Burnham.

WILLIS POLK.

Suggestions Regarding Treatment of War Memorials

The American Federation of Arts in response to requests and in the hope of assisting those throughout the country who are desirous of securing memorials, which in form and character will appropriately commemorate those in whose honor they will be erected, have issued the following circular:

WAR MEMORIALS:

Suggestions for Their Treatment.

In response to requests for advice from different quarters, the following suggestions are offered to those who are considering the erection of war memorials:

(1) Consider the amount of money probably available. Conclusion on this point must necessarily precede any determination as to the form of memorial, and is equally important whether that form be some structure, architectural or sculptural, painting or work of landscape art.

(2) Consider tentatively the form which the memorial should preferably take, whether architectural or sculptural, a painting or some kind of landscape art.

(3) Also the question of site. This question is of vital importance. In large towns the memorial if monumental should not be so placed as to obstruct traffic and at the same time should be in a position sufficiently conspicuous to be worthy of its object. Existent buildings and other surroundings should be considered in deciding location. So should also the permanence of such buildings and surroundings. This is quite as important in the case of a small village as in a large town or city.

(4) Likewise in connection with any structure the question of material, whether stone, marble or bronze. Local stone has advantages, both economically and sentimentally.

(5) The approaches to any memorial and the points of view from which it is

seen are quite as important as its immediate surroundings.

(6) The cost of laying out the site, when necessary, should be included in the scheme. The effect of a memorial is often entirely lost by lack of a careful laying out of the site.

(7) Where memorials are proposed for the interior of buildings, whether in sculpture, architecture, stained glass, mural paintings or wall tablets, careful regard should be paid to the scale and character of the architecture of the building and to any adjacent monuments.

(8) The lettering of all inscriptions should be carefully studied and should be legible. A bold Roman type, or the Italian lettering of the sixteenth century based on it, is the type most suitable.

(9) In all memorials simplicity, scale and proportion should be aimed at rather than profusion of detail or excessive costliness of material. It is the artistic, imaginative and intellectual quality of the work that gives it its final value.

(10) Before the adoption of tentative plans, and preferably before any plans are made, secure expert advice. This can usually be best obtained by calling in a competent artist, be he an architect, a sculptor, a painter or a landscape architect. If there is to be a competition, careful specifications setting forth the terms of the competition should precede it. It should be remembered that the ablest artists are not usually willing to enter competitions except for structures of the most important kind.

ROBERT W. DE FOREST,
President.

CHARLES L. HUTCHINSON,
First Vice-President.

CASS GILBERT,

FRANCIS C. JONES,

CHARLES ALLEN MUNN,

MRS. JOHN W. ALEXANDER,

ANDREW WRIGHT CRAWFORD,
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The American Federation of Arts has determined to make war memorials one of the chief subjects of its annual convention, which is to be held at the Metropolitan Museum of Art in New York in the month of May, 1919. It expects to hold at the same time an exhibition of existing war memorials which have been erected in the past in Europe and America and which will be suggestive not only for cities but equally for country villages. Meanwhile a special advisory committee of experts whose services can be placed at the call of those throughout the United States who are considering the erection of war memorials is to be appointed.

Pending the announcement of the personnel of this special advisory committee requests for suggestions and further advice may be forwarded to the **Secretary**, The American Federation of Arts, 1741 New York Avenue, Washington, D. C.

A Correction

In the December issue of the *Architectural Record* a view was shown of the garden of the estate of the Hon. George B. Agnew, South Salem, New York, in connection

with which the name of William Adams was mentioned as architect. Due credit for the designing and superintending of the garden on this estate should have been given to Mr. Charles D. Lay, of Lay & Wheelright, New York.